

The Care and Management

of

Delicate Children

THE CARE AND MANAGEMENT
OF DELICATE CHILDREN

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DELICATE CHILDREN

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PREFACE.

DELICACY in infancy being caused by an undue susceptibility to environment, the object in this work is to indicate briefly the principles which should be a guide in arranging and modifying that environment with the special view of overcoming this abnormal susceptibility. Another aim is to point out how the evil effects of this environment on the child may be met, when the environment has not been properly controlled.

This book is specially designed for medical officers of schools and others to whom the care of delicate children is committed.

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THE CARE AND MANAGEMENT OF DELICATE CHILDREN.

CHAPTER I.

GENERAL CAUSES OF DELICACY.

What is Environment?—Examples of Bad Environment—Wrong treatment before birth—Wrong food in infancy—Wrong clothing—Wrong kind of exercise—Wrong kind of recreation—Wrong management—Why some Children are neurotic.

THE environment of the child may be defined as the sum of the causes acting on the infant or embryo from its earliest existence. Viewed in this way the parentage of the child and all that is denoted by heredity naturally comes within our purview. Leaving on one side the question of remote ancestry (beyond mentioning that even the subjects of atavism may be so modified in their

early growing years that this may be largely inoperative), it is obvious that the health of the parents, and especially of the mother in the prenatal stage of the infant, may have a profound influence on the offspring. As illustrating this it may be stated that dentists are now of the opinion that the chief cause of caries of the teeth in children is to be found in the prenatal days, though much may be done subsequent to birth to neutralise prenatal errors on the part of the mother. And what is true of the teeth may undoubtedly be stated as true of the remainder of the human economy.

The medical profession has in the past been very backward in teaching that the maternal duties commence from the moment of conception, if not before. It goes without saying that healthy parents of suitable age are more likely to have healthy children than those unhealthy or of unsuitable age. It follows that delicate parents are more likely to have healthy children

in proportion as the mother keeps her health at its best in the prenatal days of the infant.

During that time it is impossible for the mother to continue to perform heavy social or household duties as before, without injury to the child. That is, each individual has only a certain amount of energy. If this is used up in the afore-mentioned way, there will be less to be handed on to be stored up in the infant for its life's battle. The fact that so many mothers with the best intentions are unable to nurse their children is due more to their exhausting themselves in performing these heavy duties than to any inherent delicacy in them. Many again, though acting physiologically during pregnancy, endeavour to resume their ordinary round of work and pleasure while nursing, occasionally giving the infant artificial food in order that they may attend dinner parties or may be undisturbed at night, not knowing that they are committing physiological sins

both for themselves and for the infant. A nursing mother who does not give up social excitements will have her milk profoundly modified. Unnatural milk will sooner or later disagree with the child, with the result that nursing will be discontinued. A question that is often asked is why mothers cannot nurse their children. They can, but it must be owned that it is difficult. And why? Because of the new social and household duties which are to blame. These have been accentuated by the increased means of communication, which have been so much augmented in the last few years, and which prevent leisure even in country houses. It is difficult for a nursing mother to avoid the advent of letters, daily callers, teas, receptions, dinner parties, etc. The daily post, with its bringing of disturbing letters which have to be answered, all have a detrimental effect on the infant's natural supply of food. News-holme mentions that during the siege of Paris, when the general mortality

due to the suffering and starvation the population endured was doubled, the infant mortality was reduced by 50 per cent. owing to the mothers being obliged to suckle their infants.

The same increase of adult and diminution of infant mortality was seen during the Lancashire cotton famine, when the mothers were not at the mills.

But it may be said artificial food does very well. While admitting this, one cannot say how much better the child would have thrived on proper natural food, for the effects of the change are not always immediate. Surely the effects of the diet during the first years of life may be felt during the whole existence of the individual? If the foundations are wrongly laid, how can the superstructure ever be sound? Consider the difference between natural and artificial food even if they be of the same chemical composition. Natural food is a living aseptic fluid; the artificial is dead (often cooked) and always

a more or less septic one. Natural food is automatically modified to meet the changing needs of the infant. Can the crude alterations made in this dead septic fluid, even when performed under medical supervision, compete with those made naturally in the living aseptic fluid? When this point has been properly explained to parents, there is generally no difficulty in getting the mothers to make the necessary sacrifices that the infant may obtain its right to have its proper natural food. On examining the huge infantile death-roll, it is only too evident that it almost wholly consists of those infants who have been artificially fed, and just as the death roll in battle is always accompanied by a large percentage of wounded, so huge infant mortality is always accompanied by a vast number of illnesses among the survivors who more or less recover — who can say how much adversely modified or handicapped in the struggle for existence—*i.e.* how delicate as the result? And if

the matter of right and wrong food is of such importance during the first year of life, it is hardly of much less importance in all the growing years. Do mothers consult doctors about the food of their children? Unfortunately they consult more frequently ignorant servants, and yet this treatment in health is of equal importance with treatment in disease. There is no doubt but that one of the essential matters for the making of a good digestion is efficient mastication, involving not only that the food should be thoroughly broken up, but also that it should be intimately mixed with the saliva. If the wrong food is given in the first year of life, *i.e.* when the jaws and teeth are developing, a bad start will be made. If a sufficiency of hard food is bitten, the blood supply and consequent development of both teeth and jaws will be greatly aided thereby, and the effect as regards life will be good. If, however, only soft food is taken, involving very little use of the jaw muscles, the teeth

and bones will not develop, nor will the food be so intimately mixed with saliva. Thus from the very first an error in diet will be made, and digestion will start wrongly.

Sooner or later the mucous membrane of the whole intestinal tract will suffer from having food insufficiently softened in the mouth; more or less of chronic gastro-intestinal catarrh will result. Probably this is hardly ever recovered from, for the reason that if it persists long, the structure of the mucous membrane becomes altered, and it will never be again what nature intended it to be. Closely associated with this condition, and often depending on it, but mostly started by carious teeth, is the question of intestinal sepsis. The better digestion is performed, the less intestinal and gastric fermentation there will be. With teeth normally developed and efficiently *used*, intestinal sepsis need not be considered; but if carious teeth are present, larger or smaller amounts of septic matter

will day after day be carried into the gastro-intestinal canal, aiding and causing catarrh throughout the whole digestive apparatus.

Many of the children whose parents wonder "what is the matter" with them are subjects of chronic intestinal sepsis.

Dr. George Fulton (*Brit. Med. Journal*, Dec. 3rd, 1904) says that "one of the difficulties has always been that temporary success may mean ultimate failure. If the injurious effects of improper feeding were immediately manifested, there would be much less of it than exists at the present day."

Writing of the various proprietary foods, he mentions that they may be valuable as temporary, but injurious as permanent, foods. "Infants so fed grow very fat. The absence from the food of some of those elements which are of vital importance may not be evident for months, and the mistake is often made that these children are thriving." But the greatest objection

to these foods is their use in the second year of life from their softness inhibiting the use and development of the jaws, teeth, and accessory glands. Mistakes in food as the cause of delicacy are less common after the second year of life, but even here there are many things which may adversely affect health. Eating between meals is a potent cause—especially sucking sweets. The cultivation of fads in diet often has very far-reaching bad effects on a child's constitution. The child that will not eat milk pudding, or meat, or fish, or any form of fat, is preparing for itself a constitutional flaw in its economy which may never be overcome.

There is a curious reluctance on the part of parents and others to combat these fads. They argue plausibly that food which is not eaten with relish is not well digested, with the result that these dietetic fads increase rapidly every year until the child will only eat certain articles of food, and these probably of

the most unwholesome nature. Nearly all children suffering from conditions of bodily weakness, such as curvatures of the spine or enuresis, are found on examination to have some fads with regard to their food. And it is especially noticeable that these whimsicalities of feeding are much more common and numerous among “only” children, or in families where a considerable interval prevails between the age of each child. How often does a doctor have to listen to some such remark as the following—“Oh! but if I make him eat this, that, or the other, he is always sick directly afterwards.” This is a common defence on the part of the mother or nurse. Nevertheless, the battle against faddiness in eating must be won, in spite of such manœuvres on the part of the child. And in order to fight this battle successfully a judicious system of rewards and punishments must be adopted, or the invitation to meals of more sensible children, in order that the child may be influenced

by their example ; and special care should be taken that no anxiety should be shown should the child miss a meal rather than eat the food placed before it. Such treatment will generally cause the fad to disappear. That these dislikes of certain foods are fads "pur et simple," or done for effect, one sees evidenced and proved over and over again by the conduct of the child when it goes to school. It is the common experience of masters and mistresses of schools designed for small children to receive from the children's mothers a long list of different foods which the "poor child cannot possibly eat." Among these they most commonly mention milk puddings, green vegetables, and fat in most forms. Yet these children, who for a year or more have not taken these foodstuffs, will without hesitation, on the first day of school, and ever after, eat these same things not only without a murmur, without being sick, but even with relish. But of course there are chil-

dren whose fads have been so listened to that their inability to eat certain things has become real. In these cases (they are quite exceptional) it is most difficult to get a proper amount of food of the right kind taken, and if coaxing and the examples of others fail, the only way is to deceive the child. Very often when all "oily" things are refused, a child will readily eat almost any quantity of butter; then instead of the usual "bread and scrape" the butter should be nearly as thick as the bread. Butter can also be put with the potatoes and green vegetables, and flavoured with salt. Thus it will be readily eaten. The writer has seen children who actually vomited at the faintest taste of cod liver oil, but who nevertheless would take quite a dessert spoonful of the same oil if well mixed with sardines, flavoured with anchovy sauce, and spread on bread as "sardine paste."

Therefore it will be seen that in the vast majority of cases the fancies

about food are simply mental. A child loves an audience, and if the natural audience provided by the companionship of others of similar age is not forthcoming, then it will call upon adults to supply the deficiency. The more appreciative the audience the more the child plays up to it; the more fuss made the more numerous the articles of diet it believes it cannot eat. Children may, and often do, get obstinate fits on any matter. They will make up their minds that they cannot eat or do certain things, and then it requires a good deal of moral persuasion to overcome these fanciful ideas. Every victory on the part of authority makes other battles easier or unnecessary.

Discussing the causes of infant mortality in the article above quoted, Dr. Fulton mentions as a cause inexperience of the mothers, and says that the mortality amongst the first born is much greater than amongst those born later. If this applies to the mortality, it also applies to the relative

strength. It is not uncommon at schools to see two brothers of whom the younger looks the older and stronger. Parents are very backward in consulting their medical men on the subjects pertaining to the health and environment of their children. Hence we find nurseries on the top floors of houses whereto all the contaminated air from the lower part of the house is, owing to the structure of the building, naturally conducted. It is no uncommon thing to find children either only partially clothed with a view to hardening them; or, on the other hand, superabundantly clothed, resulting in a chronic bath of perspiration. We perceive the children limited to an hour's walk a day, or kept out of doors until they are tired and exhausted. We observe children as a matter of routine handed over to hired attendants, who are so puffed up with their own conceit that they can hardly be persuaded to stay in families where the mother wishes

to see something of her children and have some voice in their management.

“My child is all nerves,” is an expression very commonly used. No doubt the neurotic child is more in evidence than he was a decade or so ago. The children are again the greatest victims of altered social conditions. The increased number of people who are congregated together in towns leads to a contraction of the playing grounds of the children. The natural exercise of children is not the constitutional walk. Their frames are not fit for sustained effort of that sort. Intermittent effort with rests is the natural want. The typically best exercise for children consists in turning them out together into a field or garden where they can amuse themselves. Under such conditions they will soon do so, combining amusement with exercises without any directions from adults. When left to themselves they are seldom over-tired or bored. But it is not much good turning one child

out by itself. It is worse than useless to turn a child out with a nurse or governess who will try to amuse him: a child should be with other children of his own age, and if left to themselves they will soon find ways of amusing themselves and thus getting the kind of exercise most suitable for them. They will be "bears," or "lions," or "motors," and in ten minutes they will gain more health than they would in an hour with a well-meaning governess who will not leave them to their own devices. In towns this typically good form of exercise is impossible, but it forms an ideal to have in mind when advising on a child's recreation. The more nearly the natural form of exercise obtains, the stronger and less neurotic will the child become.

And the rules which apply to the muscular use and recreation apply with still greater force to the nervous use and recreation. The children of the present generation have far too much excitement; far too much sus-

tained effort is required of the nervous system. The holidays, instead of being rest from work, are really periods of work, but of a different sort, such as sight-seeing, parties, pantomimes, etc., which really cause the children to return to school in a state of mental and physical fatigue. The primary object of holidays is to give the children's brains a rest from the mental efforts of the term. It is not so much that the parties, pantomimes, etc., are in themselves bad, but that they are too numerous. Combined with this excessive excitement we find injudicious stuffing with food and sweets at all hours of the day.

In neurotic children there will generally be found as causes of excessive excitement (especially in a form requiring sustained mental effort) injudicious feeding, unnatural or insufficient exercise, and to these are often added an insufficiency of fresh air and sunlight.

CHAPTER II.

THE GENERAL TREATMENT OF DELICATE CHILDREN.

Essential conditions for overcoming delicacy—

Where these can be best obtained—Home *v.* School—Amateur *v.* Skilled management—Objection to School—Advantages of School—Spoilt children—Naughty children—Should girls go to School?

IT being assumed that a child is delicate, what is the best method of making it strong? As the delicacy is in most cases caused by a breaking of natural laws, the remedy lies in complying with these laws in every possible way in future. That is to say, if the child has been deprived of fresh air, it should have as much fresh air and sunlight as possible. It must live out of large towns, at any rate. It should have large rooms with free ventilation with-

out draught. It should be watched over by persons skilled in such cases. The meals should be served with scrupulous regularity. The food must be plain and well cooked, and matters should be so arranged that it should be impossible for the child to get too much. The day should be portioned out in such a way as to avoid fatigue, at the same time exciting the healthy interest of the child in such matters of education as are permissible, having due regard to its special delicacy. The child ought always to be under observation so that the least further departure from health may be remedied without delay, and incipient disease controlled from the outset or nipped in the bud. It is essential that the child should have companionship with those of its own age. Having stated these essential points the question at once arises as to whether all these conditions can be fulfilled at home or nearly so? It is obvious they cannot. Even when a

trained nurse and governess are engaged, many of the essential conditions just mentioned cannot be obtained. The whole essence of treatment of those under consideration consists in skilled supervision daily and continuously by trained persons. If delicacy be regarded as synonymous with mild illness, the remedy would seem to lie in sending the patient to a small convalescent home, where, under the supervision of a doctor and a nurse, much of its condition could be remedied. If, however, the child though delicate cannot be considered ill, all the conditions enumerated above can be fulfilled by sending the child to a small private school where such children are especially cared for. The fact of a child being delicate is really a reason for sending it (whether a boy or girl) to school earlier rather than later. The earlier it is sent the more quickly the damage previously inflicted will be repaired. That all schools, or even all small schools, are not suitable for

delicate children may be admitted, but it is not necessary to send the child to an unsuitable one. The suitable ones soon become known. Reputations for making delicate children strong are not earned without being deserved. Let us consider for a moment the alternative of school, and let us take the case of parents who live in a large town or other unsuitable place. The family might move into the country, or else the child might be sent there with its mother, a nurse, and a governess. At any rate, between the nurse and the governess, if not between all three, there will be such a clashing of authority that the child will not be under skilled supervision, for nurses capable of this superintendence, and able to keep up their interest in those committed to their charge, are very rare. The child will not have the companionship of those of its own age. It is the contrary with a school, where the relative positions of the masters, mis-

tresses, matrons, or nurses, are strictly defined and where they in consequence work without friction. All have had experience, and can therefore detect variations in their charge's health. Nor are the duties of any of them so continuous that they become fatigued and consequently careless. The school hours, the games, and the meals are all ordered as the result of experience, and in most cases have received medical sanction.

Most of the objections generally raised to schools for delicate children really apply to unsuitable schools, and are not objections to the general principle. The most common objection is the alleged extra liability to contract infectious disease. One hears of delicate boys going to school, and at once getting measles, or whooping cough, etc., etc. This is true; but why is it true? Because parents have a habit of bringing their little boys up from the country at the end of the holidays, and when they are tired by a long

journey and depressed by the idea of going back to school, they think they will cheer them up by unlimited chocolates (or worse), and by taking them to a pantomime or other place of amusement. Of course, one child at least there contracts whooping cough or measles, but he appears quite well the next day, and travels to school in a saloon with a number of other boys, and the mischief is done.

The head of a well-known school for delicate little boys now sends out a circular, every Christmas, begging that none of her pupils may be allowed to go to any children's parties, or to any theatre after a given date, leaving a clear fortnight before the end of the holidays. And though all the parents do not attend to the request, very many of them do, and the result is that not a single case of infectious illness has occurred in that school for years. But does living at home confer immunity from these diseases? Certainly not; practically the liability to

infectious disease only exists in the first three weeks of the term. In other words, the child for two-thirds of the year is less likely to take any infectious illness than if he or she remained at home. And if the child should contract one of these diseases, he is in a place organised to deal with these complaints, and he will have taken it under the most favourable circumstances. It is very uncommon for children having these infectious complaints at school to suffer any permanent debility therefrom.

Another objection to school is, that by sending a child from home in this way the good influence of home life is done away with. There still, however, remain three or four months of holidays in the year when the child will come under this influence. But the question may well be asked—Is this home influence so much talked of so very beneficial? It must be conceded that its advantages under present conditions are not what they were when

home influence made, so to speak, its reputation. It is unusual now to find mothers devoting the whole of their time to gaining the affections and forming the characters of their children, and it is more unusual still to find fathers with the leisure or inclination to pursue these objects. It is very rare, too, to find families large enough, or the members of it near enough in age, to be suitable companions (that is suitable in point of education) to each other. The whole of home conditions are now so different. The experienced nurse who stays for a generation with a family, rearing the children, and taking all the drudgery of the management off the mother, is now extinct, and consequently the mother's task is much more difficult.

Owing, again, to the greater facilities for communication, the mother has less time than formerly. Callers are more frequent, servants less satisfactory and give more trouble, and in fact home life is of very much less

educational value than it used to be.

One great point in favour of school life is the universal improvement noticed among the pupils after their first term at a properly chosen school. It almost always happens that there is a general rise in the standard of health and manners, as well as in the physical and mental development. Many delicate children who are kept at home remain in very much the same state year after year. They seem to make no progress. They lag behind the standards of their age. And when this is very obvious they are said to be "deficient." These children respond at once to the extra stimulus of school life. The companionship of other children, the competition in games, the newness of it all give their development a start that it seldom loses. Often the parents are astonished that a boy or a girl who has been naughty at home is not so at school. A lady who has had much experience in the

training of small children gives as a reason for this improvement in behaviour "that they have not time to be naughty." The day is so mapped out with variety of occupation that their interest is sufficiently maintained throughout the day. A child who is naughty is mostly bored or ill. His natural energies, instead of being directed into proper channels, run riot. If the child is allowed to be naughty, often enough he is said to be spoilt. So a "spoilt" child is really one who has been neglected, one whose natural energies have been allowed to run in wrong channels, owing to the laziness or inefficiency of its parents or guardians. It is often urged on behalf of a special child that he or she is not strong enough to do all that the other children at the school do. This is, however, no real objection, for at these schools where delicate children are taken, arrangements can always be made to suit the special idiosyncrasy of any particular child, in the way, for example,

of doing less work and playing fewer games, until he becomes more fit and able to do as the others.

In choosing a suitable school the following essential points should be borne in mind :

(a) That more attention should be given to health than to work.

(b) That the number of pupils should not be more than thirty.

(c) That the school building should be especially adapted for the purpose.

The more delicate the children received, the more the first condition must be observed. That is, less of school and the more of medical management is required. Such schools should have a matron who is also a trained nurse, and such a nurse should further have had (or else one or other of the school authorities should have had) special experience in this class of work.

The greatest of efficiency is obtained in converting delicate children into

strong ones when each is treated as a hospital case in this wise. The treatment should be as follows: The skilled person in charge should not only make sure that each pupil has daily responded at the proper times to the calls of nature, but that person should personally inspect the result. The many slight variations from the normal can then be at once attended to, and serious illness often prevented.

This is a system which is carried on in a few of the most successful of these schools. A roll book should be kept and a daily note made of the result and of the effect of the remedy. This should be done whether a doctor is consulted or not. In this way the tendencies of a child to special affections can often be cured. When a child first goes to a school of this description, he should be thoroughly examined and a note of his condition made in the school case-book, together with any notes of his case furnished by others. The children should be regularly

weighed every fortnight at first, and later every month. It should also be ascertained if the kidneys be sound, and their secretion re-examined if at any time there should appear to be any variation in its appearance.

At the commencement of each term the children in such schools should all be seen by the school doctor on their arrival. In this way the spread of infectious illness would oftentimes be prevented.

That the school building should be especially adapted if not originally built for such purpose implies that the essential conditions for treating delicate children previously mentioned have been complied with.

The limiting the number of children to thirty does not mean that no school should be over that number, but that delicate children should not be sent in the first instance to schools where that number is exceeded. It is impossible that more than thirty children can receive that thorough care

and individual watching which delicate children require.

The opinions and facts here expressed, though relating to delicate boys, apply equally well to delicate girls. There is nothing in a girl's nature that can be said to be *per se* antagonistic to school life. Again attention must be drawn to the change in modern conditions brought about by increased means of communication. It is almost impossible nowadays to keep a girl protected at home. People do not stay at home as formerly. No girl, even if her education is completed, thinks of staying at home all the year round. She of necessity has to enter into the struggle for existence. The tenure of wealth being nowadays more uncertain, parents are compelled, *nolens volens*, to face the idea of bringing their girls up to being able to earn their living if necessary.

And how can there be a better preparation for this struggle than early entry into school? Here life in minia-

ture is represented, and the practice obtained in meeting its minor difficulties and trials enables the girl to meet with more ease the major ones of life.

CHAPTER III.

DEBILITY OF THE NERVOUS SYSTEM.

Delicacy of the Nervous System—"Plus and minus" activities — Disturbances of sleep — Night Terrors—Insomnia—Sleep-Walking—Convulsions—Epileptic tendencies—General Treatment.

WITHOUT being diseased the nervous systems of children may show tendencies to disease or abnormal functional activity in various directions. These tendencies may be due to inherited causes, but more often they are due to wrong environment. It is to be noted as a fact that these weaknesses are more marked, as a rule, in small families, especially where there is an interval of several years between each child. They are seen, however, most markedly in "only" children. It is rare to see an "only" child who

gives its parents no anxiety in this respect.

"My child is neurotic," or, "My child has such an active brain," are common remarks. Or, again, "My child is so slow, he is backward. You don't think he can be wrong in his head?" "It must be that he is weak?"

These are examples to which one may apply the terms "plus" and "minus" activity of the brain. The first class includes children always on the move, always asking questions, hardly waiting for the answer before launching another query, never sitting still, never keeping to one thing long. These suffer, or tend to suffer, from disturbed sleep, night terrors, sleep-walking, headaches, convulsions, etc., any one of which increases the abnormal tendencies which these children have. It becomes, then, of the greatest importance to treat and cure these symptoms as soon as possible. Disturbed sleep in infancy is often the

cause of all the future troubles. Instead of keeping the child quiet for an hour before going to rest, it is often the hour of the day when it has the most exciting time. It is common for the nurse or mother to have a romp with a child just before going to bed. That is often followed by too large a supper, after which the child is put to bed. Even an adult would not expect a restful night under similar circumstances. No wonder, then, that the child cannot sleep, or suffers from disturbing dreams. And this regimen goes on all the year round, varied occasionally by children's parties, after which the bedtime is later, the supper heavier, and the excitement greater. Soon to the child's disturbed nights become added the so-called "night terrors." Here the dreams become more vivid realities, so that the child shrieks out in terror, and for a time its reason goes, and it fails to recognise its mother or nurse.

Sooner or later it recovers, and

then, after being somewhat reassured, it drops into an exhausted condition of sleep. If these night terrors are not cured by suitable treatment, their effects become prolonged into the day, until the child becomes frightened to be by itself, frightened to go to sleep, afraid even to go to bed unless someone stays in the room with him, with a light. If he awakes and finds his companion gone, the house will be aroused by his screaming, even though the "terror" itself may not yet have occurred. This condition is not cured, but made worse by punishment or harsh speaking. It is, moreover, quite a different condition to the whining cry of pampered children who are always used to being taken up at the first cry on wakening, or who are accustomed to being wilfully disturbed by parents or nurse. The treatment of these conditions of disturbed sleep and night terrors consists in avoiding those causes which have been described as leading to them. The children should only

have a light supper of milk and bread and butter, which ought to be finished at least three-quarters of an hour before going to bed, and on no account should anything be allowed to occur that might be calculated to cause excitement during this time. When the complaint has so far progressed that the child is afraid to go to bed by itself it must, at any rate, be humoured at first. The nurse should sit in the room until the child is asleep, and it is desirable that a night light be kept burning *all* night. After a time the nurse may sit outside the room or in an adjacent apartment, the doors of both rooms being left open. Gradually, by such judicious treatment, the child will become accustomed to sleeping without anyone near, so that the doors may be closed a little more each night until he is content to go to sleep the usual way. Assistance may be obtained in this treatment by attention to the general health of the little sufferer, and especially by giving small doses

of bromide thrice daily until sleep comes naturally, and quietly accompanied by the usual awakening in the morning.

There is a condition allied to this where one frequently finds children suffering from insomnia even where there are no "terrors" to keep them awake. At whatever hour of the night they may be observed, it will be found that they are wide awake. As a rule they just lie awake without calling out or even showing signs of restlessness. This insomnia, though often due to indigestion, is too frequently brought about by the same causes as produce "terrors," and is to be cured by the same means. Or, again, a child may go to sleep normally, but will awake very early and will not manage to get to sleep again. In cases of this description sleep may be induced by food of any sort. If some biscuits are left by the bedside, a few of these taken when the child wakes will soon re-induce sleep. It is important also

to note that many of these disorders of sleep are relieved by free ventilation of the bedroom, and by increasing the amount of outdoor exercise. An inquiry should always be made as to whether these points have or have not received attention. It happens at times that the cause of these conditions is obscure. The writer was once consulted about a child a year old, who not only rarely slept, but cried or screamed during a large part of each night. Nothing in the way of treatment had any effect. When the idea of benefiting the case had almost been despaired of, the nurse and mother quarrelled. The former was dismissed at a moment's notice. From the first night after the nurse had received her *cong  *, the child enjoyed normal sleep. Nor was it possible to find out afterwards what was the cause of the insomnia. One thing was apparent: the return of sleep synchronised with the departure of the nurse.

Sleep-walking is another form of

abnormal brain action. In this case the subject is very frequently found to have parents who have suffered from some form of nervous disease or to have had markedly neurotic tendencies. Sleep-walking is a grave symptom, and not one to be treated lightly. It occurs more frequently in children of school age rather than in infants. It is perhaps one of those symptoms to which over-pressure at school can be justly accused of having given rise. Although school authorities will mostly combat this idea, it must be remembered that what is light work for a child normally constituted and of unexceptional inheritance, may be overwork for one with inherited neurotic tendencies. The most complicated acts may be performed during sleep, and the subject will have no knowledge of them in the morning. One boy known to the writer was found at 3 A.M. to have descended to the drawing-room (two storeys below his dormitory) and to have piled the furniture into a heap half as high again

as himself. On the top of this pile he had placed a lamp which he himself had lighted. This child was retained at school, but was not compelled to do any work. He was given small doses of bromide thrice daily. And in addition an arrangement of strings was made each night without his knowledge, so that whenever he got out of bed he rang a bell in the head mistress's room, which was next door to his own. Thus whenever he was about to start on his wanderings he was quietly led back to bed, and it was suggested to him, while still asleep, that bed was a comfortable place and all outside was cold. A very few weeks sufficed for his cure. Such complicated actions as in this case do not always occur. Lesser acts such as walking about the room, dressing and undressing, performing various acts of the toilet such as washing the hands, are much more common. In one case which came under the writer's notice, a boy would get up, go to another dormitory, eject another boy from his bed

and occupy his place. It was possible after getting him up to lead him back to his own bed, and on waking in the morning he never had more than a very indistinct notion that he had been compelled to leave the bed of which he had taken possession.

Whether, however, the acts are simple or complicated, the general principles of treatment are the same. Sleep-walking is a serious symptom, and one which should be removed as soon as possible. The close association of sleep-walking with epilepsy is well known to neurologists.

Infantile convulsions are symptoms which are often exhibited by delicate children. The later in life they occur the more serious they are. The special excitability of the nervous system in childhood is often held responsible for them. It may, however, be well open to question whether a nervous system of normal stability could ever be so affected by any ordinary cause as to lead to convulsions. With convulsions as with

various other conditions which occur in children, such as spinal curvature and nocturnal incontinence, a general bodily weakness must first of all obtain. Infants who have convulsions are generally bottle fed, and so the condition under consideration can be easily accounted for. Convulsions are mostly found associated with rickets, gastrointestinal irritation, tape worms, or trouble connected with dentition. As less common causes one may name uræmia, hereditary epilepsy, and defective brain development. Convulsions too may occur in the course of various toxæmias, such as the onset of acute infective fevers. Convulsions are for the most part accompanied by unconsciousness, and in very many cases they are entirely due to the asphyxia caused by the obstruction to the breathing. Indeed, it is the asphyxia which in very many, one might say in almost all cases, is the cause of death. The writer has many times had the satisfaction of converting a convulsed

and cyanosed infant into a quiet and pale if still unconscious one, by turning the child well on its side with the head well back.*

A child who has had convulsions in infancy will require special care, for convulsions in infancy may be followed by epilepsy later, if no regard is paid to this fact. The longer the time which has elapsed since the last convulsion, the safer is the child from the possibility of epilepsy.

Attacks of "Petit Mal" do occur in children, but are not generally heard of until further symptoms lead to questioning. It is not unusual for even "Grand Mal" to occur only at night. Then the only evidence may be that the child complains next day of an abrasion of the tongue, or of a tired feeling or backache, or there may have been incontinence of urine. Occasionally, however, these attacks may be

* See Bowles on "Stertor."

followed by post-epileptic insanity. In a case which came under the writer's notice,* the head master of a school was called up by one of the boys in the night because one of the three other pupils in his room had been trying to strangle another in his bed, with the words, "I am going to throttle you," and had been only pulled off by the united efforts of the other two. The master on going to the dormitory found the boy in question, who was barely twelve years old, asleep in his own bed, snoring loudly. The boy was sent later to a private tutor; he had doubtful health for some time, with inability to study. Eventually, however, he made a good recovery, and grew sound and strong. The least disturbance of the general health in a child prone to epilepsy may bring on an attack, though without such the attacks may not occur for years. A girl of fifteen had an attack while pushing a bicycle

* Rev. A. L. Hussey in "British Journal of Children's Diseases," 1904.

up a hill on a hot day. This was the first of which record could be obtained, though she had had a convulsion in infancy. It is now twelve years since she had an attack, and although she is married she has never had another. Digestive disturbance, especially where there is decomposition in the intestine, is perhaps the most likely cause. Improper oxygenation of the blood is another, which explains why attacks so often occur in crowded places and stuffy bedrooms.

As regards treatment, in the first place it may be said that those children are unfortunately not fit subjects for school. Not only must the effect on the well-being of the other pupils be considered, if the fits should occur, but the competition in games and studies would be detrimental to such sufferers. Undoubtedly, however, companionship of one or two children of similar age is most beneficial to them. Sometimes arrangements can be made, when the attacks are only very occasional or

occur at night only, for the child to be at school, but not "of school" so to speak. The pupil only attends certain classes, and does not enter into the whole routine, either of work or play; never, of course, enters for examinations. The use of bromide for these children is too large a question to be fully entered on here. The writer does not think it does any harm, provided only enough is given to keep off the attacks. The fact that the attacks may only occur at regular intervals may allow of the drug being left off entirely when the attacks are not due. There is no doubt but that in these cases the more carefully the life and habits of the child are regulated the less frequently will the attacks occur. There should always be the greatest regularity in the hours of sleep and of meals. The diet should be most carefully devised. There should be nothing indigestible allowed, and as far as possible an absence of sweets, pastry, etc., and of cereals or other

food stuffs prone to fermentation, insisted upon. The child should be kept in an atmosphere of fresh air night and day.

CHAPTER IV.

OTHER ABNORMAL MANIFESTATIONS OF THE NERVOUS SYSTEM.

St. Vitus' dance—Hysteria—Neurasthenia—
Backward children—Mental deficiency—
Moral deficiency—Stealing—Pyromania—
General treatment—Schoolmaster's treat-
ment—Caution.

ST. VITUS' dance, or chorea, is a special disease of children, occurring chiefly in those of a neurotic inheritance. These children are generally very sharp and intelligent ones. The most common cause predisposing to these attacks is fright, and the fret caused by having to do something irritating or uncongenial to the child. This is especially the case when a master or mistress or a nurse takes a dislike to a charge, and loses no opportunity of letting it be known. Another fruitful source is when a school-

fellow takes to always teasing or nagging at another. Overstrain at work or games, and severe scolding, too, may determine an attack.

It is worthy of note that subjects of this complaint have a special tendency to rheumatism, and consequently to heart disease. Unfortunately, a child who has once had an attack of chorea has acquired a distinct predisposition to a recurrence of this disease, and often an occurrence which would not affect a healthy child would be sufficient to bring about another attack of the complaint. It is quite obvious that children prone to chorea should not on any account go to school. The possible action of any of the above-mentioned causes is sufficient to negative the idea of school, to say nothing of the deleterious effect of competition and examination.

The chorea above alluded to must not be confounded with the so-called "habit chorea." This is the term applied to those tricks of speech or

gesture which children are apt to acquire, and which are so annoying to those adults who are associated with them. For instance, constant blushing, facial contortions, frequent snuffling, shrugging of the shoulders, etc., are some of the most common habits. Such as these are to be cured only by disciplinary methods.

Many delicate children exhibit hysterical tendencies, though well established instances of the disease are not so common as the public suppose. It has been said that the more a doctor knows his work, the less frequently does hysteria occur amongst his diagnoses. Still, very many children show signs of the complaint, which if not recognised and checked at the outset may render a large part of the child's future life a burden to herself and her friends. "Once hysterical, always hysterical," is a common saying. This is not true, but where once established it is, like chorea, very liable to recur, and the lesser symptoms,

if not combated, tend to grow in number.

The possible symptoms of hysteria being so varied, no one case can have them all. Generally they point to some defect of the various systems or organs. Mostly there is some excess of the emotional faculties, and a defect of will - power, or rather perhaps a tendency to excite it in a wrong fashion. "I can't eat such and such a thing." "I can't walk properly." "I can't prevent myself falling down every time I go out." Or "I won't do this, or that, or the other." These are common expressions of children, and are often applied to things unreasonable. If this sort of symptom is allowed to grow the child will become truly "spoiled." Often a child may refuse meat entirely, or farinaceous foods, or some other essential article of diet; sooner or later the child will suffer in other ways as a result of yielding to the whim, and then the parents wonder why their children have acquired curvature of the spine,

or tuberculosis, or some other form of disease. This acquisition of fads concerning food is a form of hysteria, and should not on any account be allowed. Hysteria is mostly the result of bad environment during the early years, involving a defective training. The constant presence of an hysterical member of the family will often cause the child to become hysterical. Recently it was related in a daily paper how all the children in a small girls' school had become afflicted with "the dancing sickness." The mere presence of one child who was afflicted with some form of hysterical convulsion had been sufficient to cause all the rest to be convulsed in a similar manner.

Excess of emotion, as seen when some mental strain or excitement produces a period of crying or a fit of laughing which is uncontrollable, and out of all proportion to its cause, is a common manifestation of hysteria.

Such an attack may be brought on by a severe scolding for misbehaviour,

or may be easily produced by the removal of the strain of an examination. These fits are really due to exhaustion of the nervous system in those children whose brains nature at the start endowed with strength below the normal.

When once an hysterical tendency has been recognised the treatment consists in a complete alteration of the child's environment. The one essential point is the complete separation of the child from its home and relations if such happen to be the environment in which the tendency has been acquired. The milder cases may go to school, especially to a small school. There are many of this description where there are intelligent teachers who devote themselves to the study of the peculiarities of each case, and who make successful endeavours to develop the good qualities of the patient and correct the vices. Owing to the danger of all the good which has accrued from an improved environment being undone in the holidays by

a return to a bad one, school will obviously only do for the milder cases. A bad one must have a nurse or a governess all to itself, and often it is necessary to keep the child away from home for years. All hysterical patients require unusual tact and patience on the part of everyone connected with the treatment of the case—a fact unfortunately not always appreciated at its proper value by the parents of such.

Neurasthenia is a morbid condition more commonly found amongst adults than among children. It occurs about the age of puberty, most often among those who have been inordinately pushed for examinations or otherwise forced at their work. The chief symptoms of this condition are inability to concentrate the attention to any special work, coupled with excessive restlessness after such attempts. This state is also characterised by a feeling of pressure on the top of the head, a dragging sensation in the neck

and spine, to which are added general irritability and sleeplessness, and feelings of fatigue, with sensations of heat and cold. There is also an increase of reflexes. The treatment is a rest cure of mind and body, to be followed by several weeks of running wild in the country, with of course an entire absence of lessons.

Children who are mentally deficient, or who are insane, are not suitable cases for discussion in a work of this description. There are, however, a large number of cases which, though they cannot be classed under these headings, show at times a tendency in these directions. For instance, "backward" children are in a sense mentally deficient. If a child of twelve has only the mental capacity of one of six, he is certainly abnormal, but if his capacity is only that of a child of three, he is "mentally deficient." As long as a child is only backward—that is, as long as development progresses in spite of normal treatment

at home—one may always expect to get more progress by altering the environment: for instance, the sending a child at an early age to a small school, where a large amount of individual attention would be given, and where everything would be done to give the child new interests and ideas. Such a step may with certainty be expected to produce a large increase in the mental capacity until a fair average one is reached. Instead of being backward, a child may be precocious. This may happen because the mental capacity has been developed far in excess of the bodily powers. The writer has in mind the case of a boy of five years old who could accurately make a drawing of a model steam engine with all its minutest parts. This child died very early of tuberculosis. Another child, of six years, could discuss most politics, and show considerable knowledge therein. This child also died early, of broncho-pneumonia. Another child, who from the

ages of six to twelve years had been crammed all the year round for a scholarship at one of the large public schools, succeeded in getting the scholarship, but immediately afterwards became epileptic. In addition to these children who have been pressed, a number also may be seen who, owing to bad training, exhibit all their worst tendencies in considerable development, whereas their good tendencies seem to be entirely absent. The writer has seen a little girl of twelve refuse to allow her spine to be examined because "She really could not undress before a man." This child, needless to say, had been under the care of a succession of French maids. Other children, victims of bad early environment, often have the appearance of idiots, make grimaces and silly remarks, especially when strangers are present. They often eat their meals in most untidy and even revolting fashion. Yet these symptoms are often no worse than exaggerated tricks, and

are the result of a bad training or the want of a good one. It is often a matter of surprise to the parents, and no less often to the head masters and mistresses of schools, when they discover how, in the short period of one term at a small school, these undesirable symptoms disappear under the influence of a healthy *régime*, and that under the seeming veneer of abnormality there exists a really normal child. No school would naturally desire to receive at one time more than one or two of such cases, for the simple reason that every such case requires such extra intelligent interest and hard work on the part of the school authorities. The first point is to find out what is the special interest of the child, and then to use this as a sort of lever to develop it to its utmost. For example, the child may exhibit a special fondness for the gymnastic class. Here, then, is a fact which can subserve a useful disciplinary purpose. Should the child be guilty of any misdemeanour,

the obvious punishment would be to disallow the gymnastic lesson next day. If the child's natural bent be drawing or music, then these subjects should receive every possible encouragement. It will be found that when a child can equal, or excel, other children in the school in those subjects in which it has a special interest, a desire will arise to equal, or excel, in other matters. But to effect this result great patience and hard work will be required, day after day, and week after week, and spasmodic effort will only end in failure. It is the constant drip which wears away the stone; and by a grand perseverance every difficulty will be overcome, and many children will be saved to the community, instead of spending useless lives in various institutions.

Very hard to deal with, too, are those children who show different forms of moral obliquity. There are the children who steal everything they can lay their hands on. Often the thieving

is accomplished only in a "magpie" manner, the interest in the stolen objects being lost as soon as their possession has been acquired. There are children whose thieving propensity is limited to one class of article. Thus a girl of ten years was in the habit of stealing everything in the form of rings, beginning with her mother's diamond ring, and ending with curtain rings and the eyelets for bootlaces. Again, there is another class of children that is liable to an "incendiary" mania (pyromania). This condition in its inception amounts to no more than the throwing things into the fire, as many children are apt to do. From this apparently innocent beginning they commence to light little fires in unused grates, or they will set light to matches and paper in odd corners. Finally, if not watched or punished, they will lose the sense of caution to such an extent that they will set fire to curtains or in other ways cause a conflagration.

Now the treatment and cure of these cases are in the main easy, and for the most part consist in judicious corporeal punishment or, if not corporeal, punishment in some other form that may be found efficient in each case. But some discrimination is necessary, for, whereas these symptoms above detailed are generally the only abnormal ones, it occasionally happens that they may be only the surface evidence of grave mental deficiencies.

With regard to punishment a word of caution is necessary, for with such children punishment, especially corporeal, may have unlooked-for results. There are many cases on record in which punishment, inflicted improperly through ignorance of the underlying condition, has led to the child committing suicide. The means chosen have often been suicide on the railway, hanging, or drowning. School masters, through ignorance of the risks involved, have often effected cures by means of repeated punishments

where doctors would certainly have hesitated to advise such treatment. School authorities have to lament a long list of lives which have been lost or permanently marred through the ignorant assumption of a knowledge which, owing to its disastrous consequences, it was only too obvious they did not possess.

CHAPTER V.

DEBILITY OF THE DIGESTIVE SYSTEM.

Indigestion a frequent cause or effect of delicacy
 —The rôle of oral sepsis—The care of the
 teeth—The importance of efficient masti-
 cation—Over-feeding—Rules for proper
 feeding—Importance of systematic inspec-
 tion of the excretions—The weekly dose
 —The question of alcohol.

THERE is no doubt but that a disturbed state of the digestive organs is a most fruitful source of delicacy in children. This delicacy may be either attributed to a flaw in the digestive machinery, or the weakness may be the cause of the digestive disturbance.

However that may be, it is of the utmost consequence that the digestion, upon which everything depends, should receive the most careful attention. A condition most commonly found is that

of chronic gastro-intestinal catarrh, which gives rise to constipation, diarrhœa, and flatulent distension. These are all symptoms requiring treatment on ordinary principles. The importance of curing indigestion in children is much greater than in adults. When we consider that the latter have only to maintain their organs in a state of health, whereas children have in addition the demands appertaining to supplying the wants of growth, it cannot be too strongly emphasised that indigestion means "intestinal sepsis" with all its latent possibilities of mischief. These possibilities have only recently begun to be understood. Sudden death in children from the formation of various toxins in the digestive organs was shown, at a recent meeting of the Society for the Study of Disease in Children, to be a not uncommon event. Appendicitis, too, is a result of intestinal sepsis. Without entering into a discussion of the treatment of constipation, the writer

would in passing draw attention to one important point. In this condition it is often found that the fæces occur in the form of small hard balls, which are expelled with considerable difficulty. It would seem as if the fluids and fats of the diet were either not taken in sufficient quantity or became absorbed too soon. If the motions could be kept soft there would be no constipation. This indication may often be met by the use of petroleum emulsion. It is, of course, not absorbed, and it acts as an efficient antiseptic.

Another of the chief causes of the digestive troubles of delicate children has its seat in the mouth. If the milk teeth are defective, as is so commonly the case, the permanent ones will suffer, and consequently the whole individual life, especially its early part, will be marred. It has been shown, by Mr. Turner and others, that myopia may be directly traceable to malnutrition produced by dental disease in childhood. The cause of caries of the teeth

in infancy was discussed at the Health Congress held at Folkestone in 1904, by Mr. Turner, Dr. Harry Campbell, Mr. Tubby, Mr. William Hall, and others. The general opinion expressed at this meeting was that decay of the teeth in infancy was due entirely to the use of too soft a diet. Starch and sugar, which easily undergo acid fermentation, must be considered especially harmful. The advantage of hard food diet is that the mechanical action of mastication ensures the cleansing of the teeth and gums. The use of soft infant foods are especially harmful. Caries of the teeth, as one might expect, is very much more frequent in artificially fed infants than in those fed from the breast. Teeth should be cleansed night and morning, with not too hard a brush, as this is apt to break the enamel. Some soft tooth powder should be used. No food should be taken after the night cleansing; biscuits and sweets especially ought to be avoided. After every meal the mouth should be washed out either

with pure water or with some mild anti-septic wash. This washing will remove all particles of food likely to ferment, and not only will protect the teeth, but in addition will have the advantage of preventing the results of decomposition from being swallowed. Every three months a visit should be paid to the dentist in order that the teeth may be thoroughly examined. These precautions should never be omitted, even in the case of healthy children. And if this is so, the reasons for taking precaution and for watchfulness with respect to the teeth of delicate children are incomparably greater. Now the writer's experience is that the mouths of delicate children do not receive the amount of care and attention they demand, and in many cases they are entirely neglected. It is a matter of surprise, that even medical men frequently overlook the important bearing which the state of the mouth has on the general health of children. So much so is this the case that doctors

have frequently advised patients to try sea air for children's delicacy when the *fons et origo* of their ill health could be removed by a dentist. Carious teeth form hollows where food can accumulate and decompose, then they become tender. This tenderness will prevent the efficient mastication of the food, on which so much depends the efficient digestion of it when it enters the stomach and intestines. These carious teeth are also very liable to produce alveolar abscesses, which burst and slowly discharge into the mouth. The movements of the tongue and jaws during a meal squeeze the pus from these abscesses, which is then swallowed with the food. It is evident that these repeated doses of septic bacilli swallowed with each meal are not calculated to favour intestinal asepsis. But enough has probably been said to indicate the importance of the care of the mouth. It is perhaps a subject within the knowledge of all, though it is one overlooked by many.

Next in importance to efficient mastication is the necessity for the food being of proper quality and sufficiently cooked. One is often astonished at the large meals which children eat. They certainly require more food relatively for their body weight than adults do, for they have to take nourishment not only to repair waste, but also to meet the demands of growth. If these large quantities of food have been inefficiently prepared by cooking, they will be so much the more liable on that account to ferment and disagree. Large amounts of food can be digested with ease by some children, even when the food has not been well masticated, provided that the food has been properly prepared. When food has disagreed and been vomited, it is often a matter of surprise to one to see what large lumps of food have been swallowed unchewed. Yet the occasion of the vomiting is not likely to be the only one on which the food was swallowed thus badly chewed. Neverthe-

less, even badly cooked food is more likely to be digested if efficiently masticated. When children are obliged to have all their meals in the nursery, away from their parents, the question of the food being improperly prepared is more likely to arise than when parents themselves see the meals which have been prepared for them. There is often a policy of *laissez faire* prevailing in the nursery and kitchen. Such a policy manifestly does not conduce to the well-being of the children. And the same principles apply at schools. No delicate child should be sent to a school where the masters and mistresses do not have their meals with the pupils. At home a great deal of ignorance is often displayed by parents in regard to the quantity and quality of food consumed at each meal, as well as regards the number of meals. There are many instances within the writer's personal notice where the parents have sent instructions to the school authorities

to allow extra food, and this in such quantities and so often, that it virtually amounts to eight or ten meals a day. How is it possible for the digestive organs to obtain the necessary rest? Before the food consumed at one meal has had time to become assimilated another meal is taken, with the result that fresh pabulum is added to that which has only been half digested. As one might expect there naturally follows more or less acute indigestion consequent on fermentative decomposition of the food. In this manner chronic intestinal catarrh is caused and perpetuated, varied occasionally by acute (bilious) attacks. "My child suffers so from his liver," is the frequent exclamation of a fond, but foolish, mother, when really he is only the victim of her ignorant solicitude. Another bad result is that the child becomes accustomed to abnormal dilation of the stomach, without which he feels hungry. This may cause him to suffer from indigestion all his life, because this artificial feeling

of hunger will always make him overload his stomach. So great, however, is the forgiveness of nature, and so patiently does it struggle against adverse circumstances, that children though suffering from chronic indigestion may for a long time continue to grow and put on weight. The stomach is protected, to a certain extent, by occasional attacks of vomiting, which give it more or less rest. It is also helped by attacks of fever, "chills on the liver," which one writer has described as nature holding a "bonfire" and burning up all the waste products of indigestion with which the blood has become overcharged.

In spite of these obvious mutinies on the part of nature evidencing that a child has been overfed, parents will often make these attacks a reason for feeding the child on recovery more than before, in order to make up for the meals lost during his recent illness. It is very difficult to make parents

understand that this "bonfire" is nature's urgent demand for a rest, and that any subsequent overfeeding is a dangerous attempt to thwart her beneficial action. To interfere with her at such a time is as foolish as a man sitting on a safety valve. As Pope has aptly said:—

"All nature is but art unknown to thee,
All chance direction which thou canst not see,
All partial evil universal good,
All discord harmony not understood."

A well known children's doctor has said that he had never seen a child die of starvation, but that his practice had been made owing to the pernicious effects accruing from over feeding or improperly feeding children.

Young children, whatever be the state of delicacy, unless of course they happen to be ill, do not require more than five meals a day. The older children want one meal less. The meals may thus be divided into:

1. Breakfast.

2. Lunch.
3. Dinner.
4. Tea.
5. Supper.

Breakfast should be served as soon as the children are dressed. This meal should consist of not more than two courses. The first course should consist of porridge, the second, of one of the following: 1, bacon; 2, fish; or 3, an egg. Or instead of porridge, the bacon may be followed by bread, with butter or jam. Whichever of these alternatives is chosen, milk should always be the beverage, which may be flavoured with tea, coffee, or cocoa. It is desirable that the breakfast be varied by giving porridge and jam on alternate mornings.

Lunch should be a light repast, and should be given not later than 11.15 a.m. This should consist of a glass of milk and a biscuit, or of Bovril, or beef-tea and toast.

Dinner, though the principal meal, should never consist of more than two

courses. Fresh meat and vegetables, followed by pudding with jam or fresh fruit, cooked or not, as is necessary, should be the rule. Two helpings of each kind of food may be allowed at discretion. No doubt some children are what may be called bad machines, *i.e.*, they require more fuel to keep them in running than do others of the same weight. Now this is a matter where there is scope for the skilled supervision which is obtained at the kind of school mentioned, and where it is of such great importance.

There is another matter which should receive careful attention, namely, rest after a meal. The maxim "After dinner rest a while" is a maxim worth remembering. At any rate there should be no events such as walks, games, lessons, for at least half an hour after this principal meal. And the same lucid interval should obtain after breakfast to give time for every child to attend to the calls of nature. In all schools it is a matter of the highest

importance that the number and accessibility of the water closets should be adequate. If each child in a school is to be allowed the minimum time of five minutes, it is obvious that one closet is only capable of accommodating six pupils in half an hour. So that, in a school of thirty pupils, five closets for the pupils evidently would be required. If it is a school for delicate children where the principle advocated of inspection of each action is carried out, it is obvious that a lesser number than five will hardly serve.

As the interval between tea and supper is so short, these meals will naturally be arranged to suit domestic requirements. The later the tea the more substantial it should be. Consequently, the later the tea the lighter should be the supper. Tea should in the main consist of a milk and farinaceous food: milk flavoured with tea, with bread and butter and jam, with or without light digestible cake. For both breakfast and tea,

honey or fruit food jelly may occasionally take the place of jam.

For supper a cup of milk, or beef-tea, or some of the many patent foods, may be taken half an hour before bed. If, however, the tea has been early—a thing which is not recommended—sandwiches of bread and butter, or potted meat, or fish (home made from fresh material), may be provided with the milk.

Where the children are strong, especially where not more than three hours intervene between the end of breakfast and the dinner, lunch may be omitted. But with delicate children, especially those who wake early or sleep badly, a cup of milk and a biscuit may be given in the night or early morning.

To give more in the way of food than the amounts here indicated is, in the writer's opinion and experience, to add one more adverse circumstance to those with which a delicate child already has to struggle. It follows,

therefore, that sweets between meals hampers, and visits to the "tuck shop" are relics of an ignorant past, and ought to find no place in a modern house or school. Where sweets are given at all, a thing which is often necessary as a reward for good conduct, or so that the withholding them may be used as a punishment, they should be given immediately after, *i.e.*, as part of a meal, and should be strictly limited in quantity.

There is one hygienic custom which obtained at "Do-the-boys' Hall" that can strongly be recommended for all delicate children, and that is the custom of giving a weekly dose of mild aperient. It need not, of course, take the form of that famous brimstone and treacle which was so much abhorred by the boys at that notorious establishment. There are many more elegant and refreshing preparations easily available. As the bacilli which infest the digestive organs are for the most part acid-producing ones, the writer has a decided

preference for the alkaline saline aperients, such as Eno's Fruit Salts, citrate of magnesia, or Seidlitz powders. A very great benefit to the health follows from this treatment, and the danger of an occasional "Nature's bonfire" in the form of a liver chill or bilious attack is in this way obviated.

The importance of the inspection of the actions has already been dwelt on. It is of equal importance that a daily inspection of the urine should also be carried out. At school, or at home, there is no difficulty in doing this. It is only necessary for the matron or the parent, as the case may be, to visit the bedrooms while the children are at breakfast, and examine the contents of the *pots des chambres*, and note whether there are any changes in colour or abnormal deposits. This, if anything of a morbid nature be found, should lead to the specimen being kept for the doctor's inspection. He will then, by appropriate treatment, often

prevent a more serious illness from developing.

Another battle which medical men and school authorities have often to fight with parents is one over the question of alcohol. Generally speaking, those children whose parents wish them to have alcohol are the very ones above all others that ought not to have any, inasmuch as they are in all probability the children of parents who themselves imagine that they derive benefit from its use. On the subject of the use of alcohol by children, the reader is referred to a very able and complete article on this matter which appeared in the "*British Journal of Children's Diseases*," Sept., 1904, written by Dr. George Carpenter, where he treats the whole question in an exhaustive manner. Especially worthy of quotation are the following: "The popular idea that alcohol is of benefit to children in health and disease is open to very great doubt." "It must be understood that the

amount of alcohol required to produce baneful effects in children is even in proportion to the body weight far less than in adults. Alcohol expends its main influence in the child upon the nervous system, and more especially on the higher nerve centres." "There is a fairly complete unanimity amongst workers at the subject on one point, and that is that alcohol never did any good in any chronic disease."

CHAPTER VI.

THE PREVENTION OF COLDS AND CHILLS.

Causes of cold catching, and their prevention
 —Clothing—Ventilation—Effects of fresh
 air—*Rôle* of parties, theatres, and enter-
 tainments — Night-dresses — Questions of
 vitality—Walks.

THERE is a large class of children who are considered delicate by reason of the fact that they are always catching cold, or getting colds on the liver. In each case the causes are the same or similar, but in the former case the respiratory and in the latter the digestive mucous membranes suffer. Cold catching depends on two elements, viz., the body, which may be regarded as the soil, and the microbes, which may be considered the seed. That colds are more epidemic and infectious at some times than at others proves, no doubt,

that a microbe (or microbes) is an essential element. That certain children or persons never catch cold, even when all others in the house or school are suffering, shows that cold catching is avoidable if only the soil is unfit for the growth of the seed. It being granted that the microbes are plentiful, especially at certain seasons, it becomes important to consider the conditions which make the child's constitution such that it can resist the growth of the bacilli in the mucous membranes. There are some children who are always catching cold, there are others who catch cold only occasionally, and there are those who never catch cold at all. A long study of these classes points to the conclusion that the following are the essential elements in the case. The children who are always catching cold are always those of a depressed vitality, they are found to be of weakly constitution when a careful examination has been made, although *primâ facie* they have a fairly healthy

appearance. They may have the characteristics of undergrowth or overgrowth, or they may show symptoms of rickets (past or present), or nasal obstruction, or adenoids, glands in the neck, or an unhealthy appearance, or they may be of the so-called lymphatic type. These latter are mostly nice-looking, pretty children, mostly fair with a "Dresden china" aspect. The chief cause of their catching cold is their low vitality, low resisting power to the *causa morbi*. They catch cold on every opportunity, and are very slow indeed to throw it off. Whereas some children get well in a few days, with these children the cold will last for three or four weeks. The treatment, of course, is tonic. Anything which is capable of improving the general health will do good. But there are other children of whom it may be affirmed with certainty; in every case, when the cold was contracted, and so one can say what the cause was. They had stood in a draught, or they had got wet

through, or they had gone out in thin shoes, etc. In these instances, one of the elements in the case is undoubtedly a chill to the surface of the skin. With respect to these children, the cause lies in the digestive organs. Their blood is always abnormally charged with the waste products of digestion. Their excretory organs are working at their best to keep pace with abnormal manufacture, or these organs are weak and always behind with their work. In either case a chill to the surface stops the excretion of waste products, and upsets the too finely adjusted balance. Their tissues become charged with waste products to such an extent that their vitality is reduced below the point sufficient to resist the *causa morbi*. A catarrh is the result. There is no doubt, too, that the abstraction of heat, *per se*, also lowers vitality. The children who only very rarely catch cold are those whose vitality is mostly good, and whose digestive and excretory organs mostly act in a normal manner.

These can resist chills, because their margin of vitality is great, *i.e.*, they are capable of standing depressing influences to a much greater extent before their vitality becomes reduced to a point at which it fails to prevail against the microbes of the disease. It follows then, from what has been here stated, that the essential point in all cases is a question of much or little vitality, and that the prevention of cold catching is in the first place a matter of improving the vitality of the child. All else is quite secondary to this one essential point, even though the low vitality is one of heredity.

A study of how to improve the vitality may be divided into two portions. In the first portion we may plan how to arrange the environment of the child so that an improvement of the vitality may follow, and in the second part we may tabulate those causes favourable to the development of the body so that it may be strong and calculated to be resistant.

Now one of the first essentials is an abundant supply of fresh air. On the question of fresh air, a great deal of discussion has taken place. Abundance of fresh air must not be taken as synonymous with draught, far from it. A plenteous supply of fresh air is necessary, and if this cannot be obtained in a room occupied by children, without draught, then that room is not fit for their occupation. Provided that the windows are fitted with deep sashes, and that there are ventilators, and that the rooms possess close-fitting doors, plenty of fresh air may be admitted in the most windy weather. The more the air is excluded the lower becomes the vitality of the occupants, and the more likely they are to take colds from abstraction of heat on leaving the room. And this fresh air should be supplied to all children, day and night. There is nothing harmful in night air. At night, however, the vitality of everyone is lower than in the daytime; it is then extremely important that the

fresh air should be supplied without draught, and that children should be well and carefully covered up.

Fresh air, *per se*, is not a cause of catarrh, nor is foul air alone always a cause. In the latter case there is often a contributory cause, as, for instance, the abstraction of heat. Children who catch cold whenever they go to a party, or a theatre, do so partly because they have inhaled a multitude of microbes during the entertainment. Then with their vitality lowered, produced by excitement and fatigue, they contract a chill on the way home from abstraction of heat. Adults take chills in a similar manner. There is, however, one peculiarity about children, often ignored, and that is that they are much more prone to lose heat than adults are, simply by reason of their small size. For the same reason a hot bullet will cool more quickly than a hot cannon ball. Yet it is no uncommon sight to see children made to go out in the

coldest weather insufficiently clothed, and with bare legs, when their parents would not dream of acting so themselves, no, not even at the call of fashion. Many cases of this come under the observation of medical men, when if not catarrhs, chronic congestion of the liver or digestive organs is the result. Very many children have had their whole lives made miserable by reason of a bad condition, which has been set up in childhood, owing to their being sacrificed to their parents' love of seeing them look pretty, or from an absurd persistence in a wrong idea of the method of hardening them. On the subject of clothing, however, many parents go to the opposite extreme, and load their children with so many clothes that they can hardly move without inducing perspiration. Here the vitality of the heat-regulating apparatus in the skin is lowered, and the chronically moist skin allows of sudden abstractions of heat, a thing which could not occur in one properly

clothed. It is impossible to say with certainty what is the right amount of clothing for a child. It is a matter of experience which the young parent cannot be expected to know. For instance, it is obvious that children with feeble circulations, cold, red, or blue extremities, and tendencies to chilblains, require more clothing than those who have an efficient circulatory apparatus.

Reverting again, for the moment, to the subject of ventilation, it is important that all rooms occupied by children should be thoroughly well aired when they are unoccupied. The windows should be widely opened immediately the rooms are vacated, even if they are closed again when they are in it. No room should have a thick carpet, or abundance of furniture. A room can be made bright and cheerful without being rendered stuffy. The school rooms should be thoroughly ventilated with air, between each class, for at least five minutes, and in the holidays,

when the weather permits, all the windows and doors should be kept open, day and night. A lady well known to the writer, who kept a very successful day school for many years, never had to close her school on account of any infectious disease spreading among the scholars. She attributes her success to the following hygienic regulations: free ventilation of the rooms between each class, to the use of linoleum instead of carpets, and to total absence of padding in chairs and absence of curtains; also to the fact that the hours of lessons were interrupted sufficiently well by games or exercises, in order that by these means the children might be kept warm, without depending too much on artificial heat. It is by intelligent enforcement of these regulations by trained persons, coupled to the proper regulation of the amount of clothing, that small schools are rendered so successful in curing the cold-catching tendency, when home affection combined with well-meaning

but untrained, unintelligent efforts have quite failed. In fact, it is proved in practice that those schools are most affected with a recurrence of attacks of influenzal colds, or epidemic catarrh, where the structure of the building, or the lack of intelligence on the part of the assistant teachers, conduces mostly to inefficient and improper ventilation.

It is not an uncommon thing to see children sent to school by parents with fear and trembling, and with a prophecy that the child will spend most of the term indoors, and perhaps be very ill without their care. It is equally common to find these children go through term after term without any catarrh at all, though on a return home, even if in the same town, the troubles recur. The reason is to be found in what has been here stated, and also for those reasons which have been expatiated upon in preceding chapters.

The proof of the efficacy of fresh

air in preventing and curing catarrhs has received fresh notice from the results of treating consumptives by open - air method. On this subject Dr. Chowry-Muthu, in his contribution to the *British Medical Journal*, in 1902, said, with regard to the elements which combine to bring about a cure, "Of these, fresh air comes first, by giving tone to, and bracing up, the nervous system. It lessens the irritability and calms the nervous system; it acts like a stimulant to the gastric functions. Under the influence of fresh air the patient loses his nervousness and irritability. It flushes the system with abundance of oxygen, and reduces the activity of the bacterial organisms. It is food, medicine, and more—all combined. In fact, we cannot fully estimate the value of fresh air." The remarks about the nervous system have a bearing on the treatment of neurotic children, by sending them to school in high, bracing places, or at the sea-side,

So potent is the value of fresh air in the case of catarrhs that the fashion of shutting up patients with bronchitis and pneumonia in "tents" is now quite abandoned, and the "open" method is the rule. Cases of pneumonia are by some physicians placed in a general ward between two open windows; it is said that the results are excellent.

In order to understand the immense importance of fresh air, let us consider and examine the constituents of foul air. A large amount of organic waste products are given off by every person at each expiration. A child, in proportion to its size, gives off more than an adult, for the metabolic processes are more active. The breath is not the only factor that works a deterioration in the quality of the air. The skin also is a very active agent in charging it with waste products. In addition to charging the air with these poisonous waste products, called recently by a well-known writer "atmospheric sew-

age," each individual in a room is subtracting the oxygen at each breath and substituting for it carbonic acid gas. In addition, persons in the act of moving about are stirring up dust, and those coughing send out at each cough a fine spray of moisture loaded with the bacilli of catarrh in a form in which it can be inhaled and the catarrh thereby communicated. Need one say more in defence of the necessity for frequent changes of the atmosphere? A large part of this atmospheric sewage has a tendency to condense on the walls and furniture. This is indeed a fact, pointing to the necessity for a frequent cleansing of the room if occupied by delicate children.

Another difficult matter which exercises the minds of parents and others is the question of when to keep indoors children liable to cold catching and when to send them out, having regard to the state of the weather. Generally speaking, it is a question of a child's vitality and the severity of the weather.

A child who is in good health need never be kept in for the weather. A delicate child may, if fairly well, go out in such weather as would be inadvisable were he temporarily below par. And here, again, experience must be the guide. But when such a child goes out, especially when the weather is doubtful, the greatest vigilance must be exercised in order to guard against the danger of the vitality being depressed, which may be brought about by getting chilled, or by standing about, or by walking too slowly, or by getting over-heated or over-fatigued.

A child should never be kept out too long, and on returning home should feel refreshed and not fatigued. Great care ought to be taken that the animal warmth is kept up. This can be done by pretty constant movement, and by the avoidance of too much loitering. The best time for the outing is in the early part of the day. It should not be left till the afternoon, by which time

the child has probably become fatigued. For the same reason children should not sit up late, especially in gas-lighted or hot rooms. Care should be taken that there may not be any marked difference in the temperature between their sitting - rooms and bedrooms. Delicate children require much supervision whilst they are dressing and undressing, for they are apt to dawdle over both these matters. In this way they are very liable, being in a partially dressed condition, to suffer that abstraction of heat which has been shown to be one of the important factors in the method of catching cold.

All delicate children should have flannel night-dresses, and should be watched when asleep, to see that they do not get uncovered and remain long in this condition.

As to baths, it is better to give delicate children tepid baths at night, rather than in the morning. This may be regarded as the rule. But as the

vitality of a child improves, the order of procedure may be reversed. The change, however, should be made in the summer months rather than in the cold weather.

CHAPTER. VII.

MUSCULAR DEBILITY AND ITS CURE.

The most important consideration in the prevention of cold catching—The common muscular deficiency—Children's walks—Systems of exercise : their drawbacks—Swedish and German Systems.

THERE is one element in prevention of cold catching which, important as are those already referred to, surpasses all the others in potency. It is a thorough and efficient development of the lungs by means of muscular exercises. The more the lungs are developed the greater will be their vitality and the greater their powers of resistance. And not only do the lungs benefit by this increased development, but the vitality and resisting power of the whole body will receive an augmentation. This will be further dwelt on later. At

present our whole concern is with the lungs.

It will be observed that the majority of children who come under medical care, or who have been sent to schools as delicate, are lacking in muscular development. A fact not often noticed is that while they are mostly well developed in the legs and hips, their muscles elsewhere are feeble. With the result that the lower part of the body from the feet to the hips is held in a correct position, while the remainder of the trunk has a tendency to an abnormal inclination. The most common error in carriage is an inclination forwards. Thus they become round shouldered, their heads poke too far forward. Consequently, there are lacking those characteristics which distinguish a graceful carriage in their deportment. From the constant use of such abnormal positions there result narrow and contracted chests. The reason for this is that their usual exercise consists in walking, and the

walking is conducted at such a slow pace that the breathing is not hurried, and consequently there is no physiological demand for lung expansion. Further, it is a monotonous exercise and a prolonged exertion, and is therefore only to be recommended in small doses for delicate children.

Schools endeavour, but in vain, to correct this tendency by supplementing with gymnastic exercises once or twice a week. But this condition is not entirely caused by want of proper exercise. Even if it were so, the practice of gymnastics twice a week would have but very little effect. No, the main cause of this condition must be traced to the constant assumption of bad positions, which, if the muscles are feeble, tend to create a permanent deformity. Our grandparents were so well aware of this that they plagued their children with straight high-backed chairs and back boards. These spinal deviations, forwards or sideways (spinal curvature), are more common in girls

than in boys, in spite of the bad positions assumed so much oftener by the latter, because the muscles of girls get so much less chance of development than those of boys. The development of the lungs and chest, then, depends on the amount of muscular exercise. In devising methods to further this end, means must be taken to exercise the upper half of the body as well as the lower. Now there are many systems of exercises designed for the development of the muscles, or for chest development, each of which possesses its ardent admirers, who extol the system they severally adopt, and depreciate those of which they have no knowledge. Generally speaking, the less one is attached to any one particular system, the better will be the results. The aim should be to make the exercise a recreation, rather than a task which has to be performed. Football is a better exercise for strong boys than class drill, for the following reason: the boys' minds are centred

in the game, and so their intelligence is interested, and the best efforts are put forth by the players. This is the kind of feeling one should try to excite in children, for the purpose of getting the best out of their chest development exercises. Nothing can be more depressing than the monotonous repetitions at each class of the same drills, the same movements, and the same order. The writer would like to see in each school an hour or half an hour set apart daily for the purpose of exercise. No system for the promotion of chest development will be of any use unless it is carried out daily and persevered in until a satisfactory degree of development has been attained. Later, three classes per week might be sufficient to maintain it. The gymnastic teacher should endeavour to vary the exercises in such a manner that on each successive day the exercises should differ to a certain extent from those of the day before. To the end in view, a gymnasium provided

with the ordinary apparatus is a good accessory, but even without one an efficient variety of exercises can very well be obtained. The continued repetition of any exercise or movement should never be persisted in after the first feelings of fatigue have been induced, but should be immediately changed for some other. By dividing a class into two parts, one half can rest while the other half is being exercised. When weak children are concerned there should be frequent pauses of a few minutes' duration in the exercising hour. The gymnastic teacher ought to be a person of some resource, and should be able to vary the exercises unexpectedly, or invent others at will. The children must be encouraged to undertake the performance of somewhat complicated evolutions involving the use of both arms, a good example of which is the "grand chain" in the Lancers. In the performance of such an evolution all the members of the class feel that they

have contributed each one an essential part of the whole. The best results are thus obtained, because the effects are the most permanent.

The various systems of breathing so much vaunted of late years do no doubt expand the chest. This is shown by the increase in the chest measurement at the end of the course. But this is not permanent, for if the breathing exercises are discontinued for a term, all this wonderful expansion dwindles away, and finally disappears. But it cannot be expected that children will continue doing these systematic but monotonous breathing exercises during their whole school life. The writer has been able to effect an increase in his chest measurement of two inches, by daily rowing on the river during a month's holiday, but in three months the whole of the increase had disappeared.

The object to be attained is not temporary, but permanent, enlargement of the chest, meaning a definite increase

in the amount of lung tissue, as opposed to merely stretching that already existing. This end can best be obtained by developing the lungs in a natural manner, and the natural manner is, to imitate as far as possible the methods of nature. Nature proceeds on the plan of symmetrically developing all the muscles, such as was obtained by the various movements of our ancestors in their country pursuits. The splendid development of the chest of the naked savage is not attained by any system of breathing exercises. Nor is the better development of the chest of a healthy boy, when contrasted with that of a girl, due to any system of breathing exercises. But it owes its superior development to a greater number of more active and varied physical exercises.

“Systems of breathing” cause an increase in the strength of the muscles of inspiration, so that their tone and bulk grow greater than before, and larger in proportion than other

muscles of the body. Respiratory muscles can be abnormally developed more quickly than lungs. Curiously enough, there are very few systems which give any attention to the expiratory muscles. The greater tone and strength of these muscles, when excessively exercised, enable the inspiratory muscles to hold the chest wall up, *i.e.*, they limit the expiratory movement, and so render the chest measurement greater. But the muscles are *abnormally* not normally developed, and when they cease from being abnormally exercised they return to their previous condition, and allow the chest to collapse as much as before. If the lungs could be developed in the time by these exercises, they would not collapse and allow the chest to return to its original size. They would be too large. The enlarged chests produced by some systems of exercises are like the abnormally enlarged biceps which looms so largely in the advertisements of other systems of muscular development.

To take another instance of abnormally forcing, though not a muscular one: a brain may be crammed to pass an examination and give results which have the appearance of one properly developed, but unless the cramming process is kept up, the apparent manifestations of development rapidly pass away.

All systems are not, however, bad; the German and Swedish have much to recommend them. Among other good points, the following may be noted:

1. Each system is the result of long study, and the experience of doctors and gymnasts working together.

2. Each teacher must pass public gymnastic examinations, also in physiology, anatomy, hygiene, sick nursing, first aid, etc.

3. Each teacher must have a continuous training of two years or more, and receive a certificate from the college.

4. In the German system broad physiological rules are laid down, and

teachers are encouraged to make up exercises on them, so that variety may be obtained.

Systems should not, in the writer's opinion, receive medical approval,

1. Which are not based on physiological principles.

2. Which are not the result of long experience on the part of doctors and gymnasts.

3. Whose teachers have had no proper training, and hold no certificates from the College of Physical Education and Gymnastic Teachers Institute.

4. Whose teachers are trained for less than two years.

5. Whose teachers have no knowledge of anatomy and physiology.

6. When the system consists of so many exercises repeated over and over again.

7. Which depend for much of their popularity on the singularity of the exercises and the smartness of the costume.

The writer would not by any means wish to be understood as insisting that all systems of exercises are bad, but would combat the prevalent notion that chests are to be developed by "breathing exercises" consisting of monotonous repetitions of the same movements, performed indoors. The respiratory movements, thus performed, are not the result of natural efforts, as is the case in elementary running, skipping, dancing, etc. They do not develop the lungs, because they do not cause physiological activity of these organs. Their action is solely to increase the strength of those muscles which are concerned in enlarging the chest in inspiration. The muscles are thereby strengthened so that the chest becomes enlarged, and the joints of the ribs and clavicles are made more mobile. A larger range of movement may be gained for the chest if more attention be directed than is usually the case to expiratory exercises. It becomes possible to

stretch the lungs more, and the mean circumference of the chest is thereby increased. But stretching is not developing, and when one wishes to develop the chests of delicate children, one must not *rely* on systems of breathing, but on outdoor exercises and games. The more varied these are the better. There should be different games for different days, or even different parts of a day. For this reason all schools for delicate children should have ample playing grounds or fields. They should have a "games master" or "mistress," whose duties should be to make the playtime a recreation, and not a task or bore. All sorts of games should be taught, both new and old fashioned. At one well-known school the boys are taught military tactics and drill. The children are taught to dig trenches in the soft sand, to make forts, to fit bridges together, etc. Not much is done at a time, everything is made easy, even the pieces of the bridge are numbered

to fit, but the interest of the boys is excited, and there are many intermissions and no monotonous repetitions of the same movements. For stronger children, football and cricket fulfil the same requirements. A game called "chivvy," once greatly in vogue, was another excellent one.

To sum up the matter—

1. The best means of developing deficient chests is the natural one of outdoor exercise and games.

2. These should not be persisted in after the first feeling of fatigue has been induced.

3. These exercises should be as varied as possible.

4. Some assistance may be obtained from some of the systems of breathing exercises now in vogue, but these systems must be supplementary to, they cannot replace, the natural method.

5. Many of the systems in use in schools at the present time are not founded on any rational or scientific

basis, and the teachers of such systems have not had sufficient training to fit them for the care of delicate children.

6. Mere enlargement of the chest is not synonymous with lung development.

It is unfortunate that the school authorities hardly ever, except occasionally, when it is *un fait accompli*, consult their medical officer on these matters. The whole affair is generally in the hands of non-medical people.

The *rôle* of drilling and of dancing classes will be discussed later on. It only remains to point out that delicate children suffer very often from nasal obstructions giving rise to mouth breathing. Great harm has resulted from these patients indulging in breathing exercises and games which would be quite fit for those whose air passages were free.

Nasal and pharyngeal obstructions are potent predisposing causes of cold catching, by preventing the inspired air from being warmed, filtered, and

moistened in the nose, and also by preventing proper chest development, and by its consequent effect on digestion and elimination.

The nasal obstructions must be removed before any efforts at chest development are attempted. The most common obstructions are those resulting from adenoids, and from chronic nasal catarrh. The removal of adenoids can best be done by operation, but occasionally they, and also nasal catarrh, can be cured by restoring breathing through the nose. For this, the first condition is that the nose shall be kept free from mucus by frequent "nose-blowing." Children are very remiss in this matter, and are apt to postpone the attention which the nose requires until the mucus is actually visible. They find it less trouble to breathe through the mouth. It is an irksome matter, too, for anyone to keep constantly reminding them. To meet this difficulty the author has for many years adopted the plan of

making these children wear a pad of wash-leather over their mouths. In this way, breathing through the mouth is effectually prevented. The children are compelled to breathe through the nose, and to use their handkerchiefs frequently. In a week or ten days, both of these latter conditions will become automatic, and the catarrh or adenoids will in many cases be found in the course of a few weeks to be thereby entirely cured.

CHAPTER VIII.

CERTAIN CONDITIONS OF DEPRESSED VITALITY.

Deficient muscular development—Spinal curvature : Its causes, prevention, and cure.

THERE are certain conditions of depressed vitality which, by leading to a softening or overgrowth of various tissues of the body or by interfering with the proper proportion of each tissue to the whole organism, give rise to the deformity called “spinal curvature.”

Whatever may be the immediate cause of this depressed vitality, such a state is characterised by a deficiency in, and a flabbiness of, the muscles generally, and is always benefited, if not cured, by a proper course of muscular development.

The weak muscles are unable to long maintain the erect position, and the spine consequently tends to deviate in different directions leading to the assumption of so-called "bad positions." These undesirable postures are not necessarily bad for healthy, well-developed children. Standing habitually on one leg, sitting cross-legged, leaning habitually on one elbow, are some common bad positions. In these delicate children nearly all the tissues are soft, and by habitually assuming these bad positions, muscles and ligaments become unduly stretched and lengthened, and in this way the spine assumes a permanent curve. Standing habitually on one foot causes lengthening of those muscles and ligaments which support its arch. Then the patient becomes flat-footed on this side, so that an inch or more may be lost in the length of the leg. The loss of length in one leg causes the pelvis to be carried obliquely. Oblique pelvis necessitates spinal deviation, or curvature, whenever

the child walks. The spine, having to carry the weight of the trunk, bends more easily when once curved, just as a bent stick bends more easily when pressure is applied to the ends than when the same pressure is applied to one that is straight. Other bad positions also cause similar effects in various other parts of the body, the result in every case being more spinal curvature.

Hence it follows that the assumption of correct positions at all times is an essential part of the cure. This will prevent the muscles of the two sides of the body from being unequally stretched. When sitting the child should rest the whole of its back against the back of the chair, and therefore the seat should not be so wide as to prevent this. During lessons, at meals, or at the piano this position should obtain. The chair should be pushed near enough to the table, or desk, or piano to allow this position to be comfortable. For lessons the Glendenning school desk

and seat are strongly to be recommended. Whilst standing, if this should be necessary, the child ought to stand with the feet a few inches apart in order to give a broad base of support. Standing will thus be easier, and there will be less tendency to shift the weight on to one leg. In walking the shoulders should be held back and the head erect, so as to keep the centre of gravity well within the base of the feet. The difficulty is, that all these patients are too muscularly weak to keep this position for any length of time. Their shoulders tend to fall forward, and their heads have an inclination to "poke." The remedy for this consists in strengthening the muscles at the back of the neck, and the erector spinæ and other muscles of the back, so that they are then able to hold the weight of the body with ease. The writer has for many years used the double Dowd's weight and pulley machine for this purpose. It enables different groups of muscles to

be exercised and strengthened without exercising the corresponding ones. The following will show its action on the neck muscles: A band passing round the head is fixed to the opposite end of the cord to the weight. When the child bends the head backwards the muscles at the back of the neck pull up the weight. The weight itself will bring back the head whenever these muscles cease to contract. Thus the opposing muscles will not be exercised. To exercise the muscles of the back the patient extends the sweep of the movement by bending backwards and forwards from the hips. Other back muscles may be exercised by using the double machine. The patient should stand facing this, and hold one end of each rope. Now, by extending the arms backwards as far as possible, he will raise the weights, and, as in the above instance, the weights will effect the return of the arms to the original position. Thus, not only will the spinal back muscles be exercised, but the

chest back muscles will be exercised also. By over-developing these back muscles the shoulders and head will be the more easily held in their proper positions, and the habit of stooping and of poking of the head will automatically vanish. By turning one side of the body to the machine and grasping the rope above the head with hand of the side away from the apparatus, the muscles of this distant side may be exercised without affecting those on the side near the machine, if it is so considered desirable. The use of this machine is, however, for the definite purpose named, that is, of removing the stoop and poking of the chin, and is to be considered as an accessory to the general treatment of the case.

Muscular strength alone will not produce that perfect figure which should be specially aimed at. The navy or engineer whose muscular system is well developed is not exactly a classically perfect figure, nor are the walk and carriage of professional

gymnasts things deserving of imitation. In all these cases the muscles situated on the front part of the body are too powerful, having been over-developed by the special exercises they have practised. A certain system of breathing exercises is capable of producing a protruding chest. But these are all abnormal conditions. When dealing with children, and especially with delicate children, it is the development of the body into its natural proportion which should be aimed at. Having then strengthened these back muscles, or, indeed, not waiting till the strengthening is complete, various forms of drill, Swedish exercises, or dancing classes should be added. One or other of these should take place daily, in addition to the special machine exercise. In spite of all the exercises designed to effect an improvement in muscular strength, the result is often disheartening. The reason may be found either in want of intelligence on the part of the

teachers, or in the obstinacy or laziness of the pupil. When the cause has been discovered, it is easy to apply the remedy. But it must be understood that the brains, and consequently the minds, of such children often share to a large extent in the general bodily feebleness. *Mens sana in corpore sano*. When this is the case, moral treatment must necessarily be added. A word of praise, a remark as to improvement, rewards even—in fact, any of the ways in which school authorities lead their pupils along the path they wish them to go—will often add greatly to the desired result.

For a more complete treatment of spinal curvature than can be given here the reader is referred to a work by the author on this subject. There are, however, a few points which it is desirable to mention here. The cure of spinal curvature is not purely mechanical. It is important to remedy flat foot, to see that the legs are of equal length, and that the clothes are

not so tight in front as to prevent full chest expansion. The cause, however, of the depressed vitality which was the root of the deformity must be made out, and the remedy applied. Thus, if the causes be anæmia, dyspepsia, or want of fresh air and sunlight, they must all be removed if possible, and drugs, if necessary, administered.

Fortunately exercise, whether medical or natural, has a distinctly beneficial effect on the system, for it increases the metabolism of the muscular tissues, and therefore the amount of heat in them. They then consume more oxygen, whereby the blood becomes more venous and less arterial. This accelerates the movements of respiration, which in its turn increases the flow of blood through the lungs and quickens and strengthens the heart beats. The same changed condition of the blood also causes the vessels in the skin to dilate, and the perspiration glands to act. Regular exercise,

which systematically does all this, day after day, must, and indeed does, have a most important effect in improving the general health.

Thus the general nutrition of the body is improved, partly in consequence of the increased demand for food, partly as a result of the increased elimination of waste products, and partly by the raised body temperature. The muscles have been aptly called the "furnaces of the body." If the muscles be ill-developed, the furnaces will be burning low, and the body machine cannot perform its proper work. Exercise causes the furnaces to burn up again, and so restores the efficiency of the machine.

When a child is found to have acquired a spinal curvature, the question arises as to what is best to be done. As the cure depends on the systematic carrying out of all the many things which have to be done in order to cure the complaint, and the condition which allowed it, the

writer is of opinion that the child should be sent to one of those small private schools where such cases are specially looked after. In very few houses can the necessary system and method be obtained. When, which is very rarely the case, the curvature has developed at school (it should probably be more correctly described as discovered), it has to be decided whether the child shall be removed from, or retained there. If the school authorities are not unwilling to keep the child, she should certainly be allowed to remain, but the amount of work ought to be cut down to a minimum. In this way the child will have the advantage of the healthy influence of school life, and the necessary treatment can, at the same time, be proceeded with. The exercises prescribed should be performed at the most suitable time, and no lessons should be allowed to interfere with them. The best time for practising the exercises is in the morning, between from an hour after

breakfast to an hour before luncheon. After the exercises there should always be a rest of half an hour before the next meal is taken.

A large amount of fresh air is essential, and many hours daily should be spent out of doors. It need hardly be pointed out that the patient must not be exercising all this time. When the weather is fine and warm she may have several short walks, or out-door games with intervals between each. Rest should be taken in chairs or lounges with straight inclined backs in the garden. In winter, rest may be taken indoors with the windows open, but the outdoor clothes should be worn. If the weather be cold, a rug wrapped round the legs may be added. Special attention should be paid to the sleeping apartments. The patient should go to bed early, in order to avoid hot, gas-lighted rooms. In this way the health and strength will return, and the curvature, if noticed early, will be easily cured.

CHAPTER IX.

SOME SPECIAL DEBILITIES.

Cardiac debility—Heart murmurs—Growing pains—Debility of the kidneys and skin—Socks *v.* Stockings—Anæmia—Tubercular tendencies—Eneuresis, or bed-wetting.

HEART WEAKNESS.—The occurrence of heart disease in childhood is always a matter of concern to those who are responsible for these cases. Although the treatment of symptomatic disease does not call for special remark here, much, however, in the less serious cases can be done for those children in whom physical signs only are present, while all symptoms are absent. It is these children who derive so much benefit from being sent to such small schools as have previously been advocated. Cases of congenital heart disease have generally such obvious symptoms that their

management does not concern us. In the cases alluded to, a murmur having been discovered, the child's life is often made a misery by many numerous and needless restrictions. The origin of the cause of the murmur is to be traced to antecedent rheumatism, chorea, scarlet fever, or measles. But it is to rheumatism that the endocarditis is in most cases due. It does not necessarily happen that the child has had rheumatic fever. Though the evidence of rheumatism is often of the slightest kind, still it may be mostly found on careful inquiry. The way in which children are clothed is often responsible for the rheumatic pains stigmatised erroneously as "growing pains." The exposure of bare legs in the depth of winter, in order to satisfy the mother's æsthetic sense, or as a concession to the ignorance or laziness of some nurse, is often a fruitful cause. A more criminal form of ignorance is the compelling of children to go without shoes or stockings. To the grave risk of

cold is added that of physical injury or of septic inoculation. A very large element then, in the prevention of heart disease in childhood, consists in avoidance of rheumatism.

In connection with this subject there must be borne in mind all that has been said about intestinal asepsis. All persons who have a predisposition to rheumatism have a special tendency to acidity. This should be met with small meals which can be easily digested. There should be plenty of variety in the food, and it ought to be plain and fresh. There should be no overloading of the stomach with excess of starchy materials, and no sweetmeats should be given at all between meals. Dr. Eustace Smith has sensibly stated that "It is often remarkable to note the immediate improvement which takes place in the condition of a child who has been pampered and overfed because he is so delicate, when these simple rules are attended to."

These cases without symptoms do very well indeed if only they are properly managed. They repay the care bestowed on them. The murmurs in the process of time not infrequently disappear altogether. An adult suffering from heart disease is liable to sudden death, but such an event is extremely rare in childhood; so rare, indeed, that its possibility need not enter into the calculations of parents or guardians. Embolism is not uncommon, but no special means of preventing it exist beyond attention to the general health.

The general rules, already mentioned, for the management of delicate children, apply to these cases with even greater force. They should not be over-fatigued, although exercises designed to develop the general muscular system are distinctly advisable. Violent exercises, and especially competitive ones, should be avoided. Thus no child with an incompetent valve should be allowed to participate

in athletic sports, or tennis tournaments, or football. But cycling, golf, games of tennis, cricket practice, hockey practice, etc., are all not only harmless exercises, but even do good. Such games played as matches would put too great a strain upon the heart muscle. The first symptom that is noticed when a child with heart disease is doing too much is "breathlessness." If the child is found to become breathless more easily than its companions, then it is evident that his powers are not equal to theirs. But in all probability the very best protection which these children can have is afforded by a regular medical examination. As the child grows older it unfortunately gets passed on from one school to another, and thus comes under the care of a succession of doctors. In order that each doctor may have a proper history of the case and thus be able to advise to the best advantage, the parents of such children should always have a book wherein the child's condition can

be from time to time recorded. This book should always be given to each new doctor who may have the medical supervision of the case. Observations and records should be made and entered into the book at the beginning, middle, and end of each term.

If the treatment for delicate children, detailed in previous chapters, be adopted in the case of children suffering from heart disease, they will then be not infrequently very little inferior to others in health and strength, and will grow up to be strong, useful members of society. In fact, without this special care, many first discover their infirmity only when, being grown up, they go to insure their lives.

Kidney Weakness.—What has been written about the general treatment of heart delicacy may be stated in almost identical terms with regard to children who have a tendency to kidney complaints. Whether the flaw is the constant, or occasional, presence in the urine of a small quantity of albumen, or uric

acid, or other abnormal matter, the question is mainly one of the improvement of general health on the lines laid down. Everything is of importance, but the care of the digestive system, and a maintenance of the healthy action of the skin, the most of all. There is no doubt but that the more normally the work of digestion proceeds, the less abnormal, and therefore the less harmful, work the kidneys will have to perform. It is not so much the nature, as the quantity of food that is the essential matter. The avoidance of excessive fatigue is just as important in these cases as it is in heart disease cases. It is advisable, too, to see that the child is encouraged to drink freely of water, so that any irritating products of digestion may be diluted as they pass through the kidneys. Children who have a tendency to kidney trouble should always wear woollen garments, both in summer and in winter, by night and by day. The normal excretory functions of

the skin should be encouraged to the utmost. In cold weather a light overcoat should always be worn, even on days when other delicate children might not necessarily wear one. Extra efforts should be made to develop the heat regulating apparatus of the skin by means of shower or spray baths daily, the temperature being gradually changed from hot to tepid, or even cold, and *vice versa*, several times. The presence of a small quantity of albumen in the urine may be expected to disappear entirely under treatment. It is well to have the urine frequently tested, and any variations of health entered into a record book. By this means it is often possible, when any temporary increase of albumen occurs, to trace the cause, and, by avoiding it in future, to approach more surely towards a cure.

Skin Complaints.—Many children are inclined to eczema and other abnormal skin rashes. In these cases, as is well known, the cause is to be sought in the

digestive system. These skin complaints, then, may best be treated and prevented by paying attention to all those matters which make for securing a good digestion. It is useless to treat these cases by change of climate or local remedies when the cause of the trouble may be in the food or manner of feeding or of eating. The custom of giving sweets between meals is to be deprecated as a fruitful source of eczema. The occurrence of eczema in children at the seaside schools is almost unknown, notwithstanding the popular idea concerning the malign influence of sea air on this complaint. It is, however, no uncommon matter to find children returning to school after the holidays presenting many different forms of skin complaints, which rapidly disappear under the combined effects of magnesia and proper food. It must be admitted that one of the great drawbacks to the efficiency of school management lies in the fact that in the present day parents labour under the

fond delusion that their children may commit any number of gastronomic sins during the holidays with impunity, because they are convinced that on their return to school the regular regime of school-life will soon restore them to their normal state of health. Broken windows, however, have to be paid for as well as mended.

Anæmia.—Anæmia is another common condition met with in delicate children. This state also calls for the observance of the ordinary rules of health, in which are comprised *a maximum of fresh air and a minimum of fatigue*. Anæmia is often neglected as if it were a necessary condition of debility. No special line of treatment is carried out until one of the many possible complications of anæmia intervenes. This is a serious matter, as these possible complications may be frequently of a very grave character. The writer more than once has seen children of thirteen and fourteen years of age die within twenty-four hours

from the perforation of an unsuspected gastric ulcer. This occurred in children who were not even under medical treatment.

Anæmia should never be neglected. Any case may turn out to be serious. And the condition is mostly so amenable to the routine treatment that there can be no possible excuse for not giving it a trial. Recent researches have shown that there is frequently a connection between anæmia and oral sepsis, which makes it more than ever necessary to see to the mouth toilet and to the condition of the teeth. The diet, too, should be of the non-fermentable kind; that is to say, there should be a minimum of farinaceous material, with as much fresh albuminous food, together with eggs and milk, as the digestion can manage to assimilate. Those who are not excessively anæmic may take exercise out of doors, or even indulge in out-of-door games, provided that the exertion is not too severe or too long sustained, and does not lead to

excessive fatigue. But in those schools where such cases are understood, very little alteration of the daily routine is necessary beyond the taking of such doses of iron and aperient medicine as may be prescribed.

Tubercular Tendencies.—The ordinary health rules are applicable also to those children who have a tuberculous tendency either of the lungs or of the lymphatic glands. In the latter case special attention must be paid to all possible sources of irritation, such as those proceeding from eczema of the scalp, catarrh of the throat and nose, and irritation having its origin in bad teeth. It should be remembered that glands are much influenced by the state of the digestive organs. All enlarged glands are not tubercular, *cela va sans dire*. In company with Dr. Bowles, the author once visited the Board schools of this town and examined the necks of 1,200 children. It was found that in the infant classes the glands of nearly all the children were

more or less enlarged. As the elder children were examined it was found that the enlarged glands became fewer and fewer as the age of the children increased, until in the oldest class hardly any were found. These latter, indeed, only showed two per cent. of scars, and very few of these appeared to be caused by tubercular disease. It is probable that in better-fed classes the percentage of those which ultimately suppurated would be very much smaller. Be that as it may, it is of considerable importance to pay every attention when glands are found to be enlarged.

In all cases where there is a tubercular tendency it is obvious that good feeding and fresh air are the main paths of cure, and these paths must be kept long after the tendency seems to have passed away. In those prone to tuberculosis, tubercular deposits are apt to suddenly occur like the abrupt onset of a storm, and numbers of different foci will appear more or less

simultaneously. It is probable that in these cases the poison has got into the circulation from some unrecognised source, such as, for instance, a gland in the neck ulcerating into a blood vessel. Mr. Watson Cheyne has shown sections where this is actually occurring. It is, therefore, important in the extreme that all recognised foci and tubercular glands should, if possible, be removed as soon as the disease has been diagnosed. The great success which has attended the fresh-air cure should lead to the employment of a modified form of this treatment in all cases where the tendency to tubercle is at all marked.

**Eneuresis, or bed-wetting.*—The variety of causes to which this condition has been attributed, and the very diverse treatments which have been recommended for its cure, suggest that

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its pathology has not been accurately studied.

The subjects of the complaint are mostly unhealthy in aspect, being either anæmic, bilious-looking, or lymphatic. Their skins are dull and inclined to acne or some of the low forms of eczema. They generally are not fond of meat, eat irregularly, and live mostly on farinaceous and saccharine foods. They are disinclined for exertion or school work. If these children are subjected to the usual routine of being taken up frequently during the night to pass water, they are found overcome with sleep and very difficult to rouse. They seem in a kind of stupor, into which they at once relapse on being put back to bed. At each time on being taken up they pass a large quantity of urine. Yet a short time later they are found asleep, and the bed "deluged" with water. If the urine be measured it will be observed that there is seldom less than two pints passed in the night, and that this is

sometimes nearly or quite doubled. On analysis the urine is found to have a very low specific gravity (1002—1005 is not unusual), neutral or alkaline reaction, and with a deposit of triple phosphates or oxalates. Very frequently a trace of albumen is present. The condition then at night is one of polyuria. The urine tends to become normal in the daytime, except in cases where the incontinence is continued during the day. The large quantity passed and the way in which the bed is "deluged" show that the bladder is not emptied until it is full. The un-irritating urine does not give a sufficient "call" to the central nervous system to awaken the patient, but enough to start the necessary reflex for emptying the bladder only.

The treatment of this complaint, which has for some years been successfully carried out by the writer, was suggested by the consideration of a similar condition which occurs in infants fed on starchy foods. Such children

always pass a larger amount of urine than normal. Their nurses complain that they are always soaking their diapers. When their starchy food is cut off this symptom disappears. It is the same with the victims of eneuresis. In most cases a rigid anti-diabetic diet removes the symptom in a few days. The *cause*, however, due to a general depression of health produced by an excessive starchy diet requires general tonic treatment at the same time. During the cure starchy food may usually be allowed for breakfast without "accidents" occurring at night. Without any other treatment hospital cases are relieved often at once, and finally cured, by being taken as in-patients and fed on the ordinary hospital diet. In private cases even small quantities of bread or cake, given at dinner or tea early in the treatment, cause the bed-wettings to recur. In about three to four weeks, sometimes sooner if the tonic treatment is pushed as well, a normal diet may be given without eneuresis happening.

Whilst not wishing to contend that eneuresis is a condition of late rickets, the writer is of opinion that it is a weak bodily condition caused by an excessive starchy diet, and associated with inability to properly digest that excess.

CHAPTER X.

CONVALESCENCE AND CHRONIC ILLNESS.

Debility due to prolonged convalescence or to Chronic Illness—A Study of these states—Essential points in their management which conduce to permanent restoration to health.

THE subjects of convalescence and of chronic illness will be treated together, because they present many similar features, both in their pathology and treatment.

Convalescence may be defined as that period of disease which is intermediate between the cessation of its more prominent symptoms and the full restoration to the previous state of health. It is, therefore, definitely a state of illness. Miss Nightingale says, speaking of the nursing of convalescence: "Many cases would be

irretrievably lost but for careful nursing; some would become permanent invalids, others burdens to themselves and their friends for the rest of their days. There may be a return to life, but return to health and usefulness depends upon the after-nursing and treatment in almost all cases."

The symptoms of convalescence in general are those of lowered vitality, most marked in one or all of the nervous, circulatory, or digestive systems. The patients are incapable of the sustained use of any organ, more especially of that affected by the disease. A little mental effort easily tires them; they are apt to be cross and irritable; they show great sensibility to changes of temperature, and they suffer from shortness of breath on exertion. Their digestive organs are easily upset; they are incapable of much muscular effort. Palpitation is easily excited; the urine frequently shows excess of phosphates or of urates. The organism, in fact, easily gets out

of gear, and the colour and expressions of health are absent. The temperature is more unstable than in health, shows greater daily variations, and undergoes very considerable rises on provocations which in health would be powerless to affect it. It is evident, then, that children require much more care during convalescence than even do adults.

Now all the causes of the lowered vitality may be included under some or all of the following:—

1. Continued high temperature.
2. Changes in the blood giving rise to altered nutrition.
3. Shocks, and loss of nervous control.
4. Changes in the circulation.
5. Large losses of blood, or some of its constituents.
6. Want of nourishment, mostly from disorders of the digestive organs.

Out of the 1,800 patients who annually pass through St. Andrew's Convalescent Home it may be said that no less than a fourth have suffered

from diseases characterised by having high temperature as a symptom. It is a matter of common knowledge that the vital forces are considerably lowered in fever. Nor is this to be wondered at when it is remembered that in fever every organ of the body is affected, whatever may be the cause of the rise in temperature. The cells of the muscles, and of every organ, undergo structural changes which can be seen by the microscope. The increased excretion of nitrogenous matter by the kidneys shows an increased disintegration of the albumen of the body. The lowering effect of fever on the nervous system is well shown by the mental depression after its subsidence, and by the frequency with which many forms of mental disease come on after acute illness. The granular and fatty changes which are known to take place in the cells of the digestive organs cause the latter to fail in furnishing their normal digestive juices, as is evidenced by such symptoms as the

dry mouth, absence of appetite, constipation, light motions, etc., so that very little digestion of food occurs.

When a patient is in fever, he is not only burnt away, but starved. Here we find an additional cause of lowered vitality—emaciation. The urinary pigment is much increased, showing that larger numbers of red blood corpuscles are in process of being disintegrated. But most important of all is the effect of fever on the heart. Fever makes the heart to beat more rapidly, and consequently it undergoes more wear and tear. It is then fed less; it is flooded with more poisons, the result of tissue waste. No wonder, then, that the cause of death in many acute illnesses is cardiac failure. The marvel is that it does not happen more often. An organ which has been so badly battered requires, but seldom receives, sufficient care during convalescence. It is no uncommon thing to find dilated hearts among convalescents. Such hearts

require the very greatest care during the time of convalescence.

Beside the changes in the blood produced by altered metabolism, convalescents also suffer from diminished excretion. Not only are the excretory organs still feeling the effects of the recently high temperatures, and still undergoing repair, but they are necessarily without the healthy stimulus of exercise. The muscles, too, having undergone that degeneration which was first described by Zenker, are unfitted for much exertion. Different diseases produce special changes in the blood, further serving to clog the machine, *e.g.* rheumatism and anæmia. The general mechanism of the circulation has been upset by the altered conditions as to temperature, independent of any special heart affection. In cases of a febrile illness, the circulation has suffered from the enforced rest. It is, so to speak, out of training. Patients convalescent from fractures are often as feeble as those who have

undergone high temperatures. The heart and circulation, and indeed all the organs, have suffered from the enforced rest, and consequent deficient elimination of waste products.

The feeble digestions, the diarrhœa, or constipation following on fevers are notorious, but very similar conditions obtain after various other diseases connected with the digestive organs, and also from the prolonged rest entailed by surgical injuries and operations. The wounds heal mostly very quickly, but the patients are not themselves for a considerable time. They, for a longer or shorter time, have little or no energy, and they have a tendency to suffer from various slight ailments which all point to loss of tone. Of course this condition described above does not always occur. One is frequently surprised at the rapid recovery children make after accidents or after operations. Nevertheless, children are frequently met with who are ill for weeks even from the shock produced

from tooth-extraction. A shock of this kind is often unnecessarily great because a child has not been told what is going to happen ; consequently the surprise caused by the unexpected pain adds to the shock. When it is necessary to hurt a child, as is sometimes the case, this should be explained to him, and he should be encouraged to bear it "like a soldier."

Chronic illness may be simply a prolonged state of convalescence ending in return to health, or it may be condition arising *de novo*, and never reaching an acute stage. Nevertheless, the patient is in a very similar state to that of a convalescent. Fever may be present, but even if it is not, there is the same loss of exercise and consequent retention of waste products. The same sort of cardiac weakness obtains, and there is the same tendency of the system to react excessively to slight causes. The digestion becomes feeble and the muscles also. Whatever may be the special features of the particular chronic

illness, this state is common to all of them, and the recognition of this fact is of the first importance in treatment. *The illness, whether chronic or acute, has produced a change of habit and environment.* The necessary rest which the illness entailed has helped to produce the condition characterised by retention of waste products, and of muscular and cardiac feebleness; these in turn have contributed to the loss of exercise. When a child is suddenly attacked with an acute illness, this change of habit and environment is obvious. From taking plenty of exercise and food, he is suddenly confined to bed, and in place of solids, has liquid food. His tissues, instead of being automatically repaired as wear and tear occur, now quickly undergo degenerative changes, and become choked with waste products. These changes are obvious enough in an acute illness, but they are less obvious in a convalescent or chronic state of illness. The recognition of these changes, however, is just as im-

portant for the efficient management of a convalescent or chronic state. The difference between the two latter states lies chiefly in the fact that a person convalescent from an acute illness has not had time to acquire so thoroughly that change from active to passive habits which, to a chronic invalid, in course of time becomes a second nature. It is these acquired and passive habits which in very many instances form, much more than the disease itself, the real bar between illness and recovery to health. Our aim, then, should be to get the convalescent child to take up the threads of its ordinary life with as much rapidity as is consistent with safety. In chronic illness the same end should be kept in view. Parents, however, are often so timid about their children that they are coddled and pampered for weeks or months longer than is necessary, thinking that by acting so they are on the safe side of the hedge. It cannot, however, be too strongly insisted

upon that great harm may accrue from this method of procedure. Not only is the restoration to health delayed, but it may be for ever prevented. The child is made nervous, and often never gets rid of the habit of thinking of his or her health, or gets into the way of always imagining illness when none is present. A child's illness should never be discussed before it. No doubts about recovery should ever be expressed, or anxiety shown in its presence. And all who enter the sick-room should present a cheerful demeanour.

It is in bringing about this transition to normal habits that change of air and scene produces such good results. The treatment of almost any chronic deviation from health may be assisted by a judicious change of air; for by going away the patient is taken from most of the environments of illness and sees new scenes, new people, and gets new interests. After a short acute illness there is generally no difficulty in getting children to resume their usual

habits, but after a long one, or after a chronic illness, the task is greater, because the damage done has been greater and the habits of illness have become more confirmed.

The problem of getting the patient to resume the ordinary habits of life will be lessened and made easier by the adoption of any method of treatment which will produce on the patient, while still in bed, the beneficial effects of the exercise compulsorily stopped, but in a lesser degree. Such a method is provided by the use of medical exercises, a number of which will be found in the appendix to this book. By careful and judicious use of them, for a few minutes at a time, twice or three times a day, when still confined to bed, and afterwards very gradually increasing them in the early days of convalescence, most satisfactory results will be obtained in the way of shortening the length of the convalescence or chronic illness. Far less tiring than massage, capable of being carried out

by any intelligent nurse, this treatment is able, in a very short time, to rapidly strengthen a patient whose powers may for a long time have shown no signs of improvement or response to the medical care lavished upon them.

There are very few conditions of convalescence or of chronic illness in which the seaside is not the most favourable place to send a child to complete a cure. Indeed, all the coast towns are used for this purpose. The remedial effects of sea air on enlarged glands and other tubercular affections are notorious, but equally good effects are obtained from sea air in most other chronic illnesses. For the successful management of convalescence, routine and regularity are necessary. The whole day should be mapped out for them, with times of rest and exercise. The hours of meals and medicines should be stated, and the meals themselves should be supervised as to quality and quantity. The food should be given in frequent small meals, in

which albuminous matter takes a larger proportion than normally. This must, of course, be taken in an easily digested form. Above all, one should avoid filling the child's stomach with large masses of food of low nutritive value. There are many means to the end indicated, which will necessarily vary with the case to be treated.

One of the greatest aids in the treating a convalescent child is that *rara avis* a good nurse. Nurses, unfortunately, often lose their interest in a case when it has become convalescent. To keep them up to the mark it is best to get them to continue filling up their report paper daily, and for the doctor to read them. In order to excite and maintain their constant solicitude in a case it is most desirable to prevail on them to fill in the ordinary daily statement of facts regarding the patient. The doctor should never miss seeing the report, and should carefully peruse it at each visit. Nurses are especially useful when the child first begins to

take exercise, as they, being present, are able at once to check any tendency to over-exertion, and to see that the rule "that the patient should put on extra covering, temporarily, whenever perspiration is induced," is enforced.

The essence of the treatment of convalescence and chronic illness lies in the fundamental maxim, *Festina lente*. One must bear in mind the manner in which convalescent and chronic invalids differ from healthy children, and endeavour to remedy these defects without adding to the patient's difficulties. Progress must necessarily be slow at first; the heart and nervous system have to be gradually strengthened. Food and exercise must be so arranged as to aid in rebuilding the constitution, without putting unnecessary additional strain on the excretory organs.

Graduated medical exercises are an immense gain and advantage, but when coupled to change of air and

scene, the benefit likely to accrue to a convalescent is enhanced in the extreme. Therefore, it is of the utmost importance to remove the convalescent child at the earliest possible moment to the nearest seaside resort, where there is abundance of stimulating aseptic air, so that, being subjected to the invigorating influences of nature's own tonic as well as to the chemical rays of light, health, temporarily lost, may be recovered in all its former glory.

APPENDIX.

PRELIMINARY NOTES FOR MEDICAL EXERCISES.

1.—Before practising these exercises, the patient and one of his relations, if the patient be a child, should be properly instructed by a skilled person, *i.e.* a medical man or a gymnast. A few movements only should be learnt at a time, and others added at each lesson as the first are perfectly performed.

2.—It is essential that at least one of the daily lessons should be performed at a gymnasium, even where no more of the gymnasium apparatus than could be fitted up at the patient's house is used. The patient will be then sure of having at least one lesson efficiently, properly, and regularly performed.

3.—All the exercises herein detailed are meant to be performed with slowness, ease and grace, without jerking or holding the breath. No exercise is to be continued after the first feeling of fatigue is induced. There should be a short rest between each, the length of which should depend upon whether the exercise has been

one requiring little or much expenditure of energy. It is advisable, as far as possible, to interpose an exercise inducing little force between two requiring more. Where possible, the exercises should be performed before a looking-glass, so that the patient can see that his position is correct ; the exercises are to be performed as ordered by the doctor, but generally those done without apparatus can be gone through once daily at first, and twice daily as the strength increases.

4.—Between the different exercises a pause should intervene in moving from one position to another.

5.—Before commencing the following exercises, the patient must practise breathing properly. He must inspire as fully and as deeply as possible without strain through the nose, then, with the mouth open, expiration should follow at once without effort, being performed by the elasticity of the chest and lungs alone. Both movements should be easily and regularly performed, and a short rest should follow each expiration. After each three double movements, there should be a longer rest occupied by at least three ordinary breaths.

6.—For very feeble patients the exercises have at first to be performed passively. That is, instead of actively performing them, the gymnastic master or other person takes hold of the patient's limbs or head, as the case may be, and causes them to perform the required movements. Thus

the patient himself makes very little exertion. As he becomes stronger, he may be permitted to perform the exercises himself without this help.

Part I.

HOME EXERCISES.

SERIES A.—LYING ON THE BACK.

General Instructions.—The patient lies down on the floor or table, heels together, shoulders at the same level, head straight, arms extended by the side of the body, palms facing upward. The shoulder blades to be pushed back, so as to expand the chest, and the whole posterior surface of the body should be applied to the surface of the table, so as to efface as much as possible the lumbar bend.

1.—*Arms in three positions.*—
 (a) By the side of the body.
 (b) Straight out, forming with the body a cross.
 (c) By the side of the head touching the ears, and as straight as possible. Breathe while resting in each attitude; return in the same manner to the position of rest.

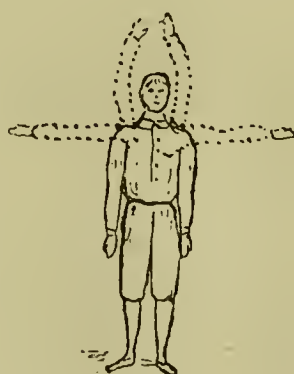


FIG. I.

2.—Raise each leg to the vertical, knee kept

straight ; return to the position of rest, the other leg immovable.

3.—Bend the head to each side, so that the cheek rests on the ground ; return slowly to the position of rest without moving the shoulders. The arms must be kept immovable, palms upwards.

SERIES B.

General Instructions.—Same position as above, except that in each case the movement starts from the following position : the elbows close to the side, forearm bent upon the arm, fists closed, with the thumb side to the shoulders.

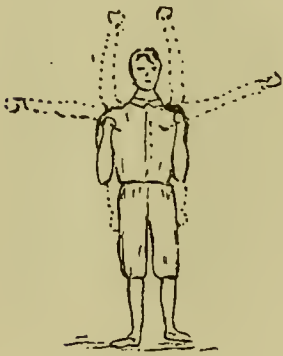


FIG. 2.

1.—(a) The length of the body. (b) In a cross. (c) Vertically upwards. (d) By the side of the head.

2.—Move out each leg transversely, knee kept straight, the other leg immovable ; return to the position of rest.

3.—Bend the head until the chin touches the chest ; return to the position of rest.

SERIES C.

1.—*Circular turn of the arms.*—The palms upwards, the arms describe a half circle on the ground to rejoin at the sides of the head ; there the fingers cross each other. The patient stretches out as far as possible, and brings the

arms back parallel by the side of the body by describing a half circle in a vertical plane.

2.—*Circular movement of the leg.*—The leg held straight is lifted vertically, carried outwards to the ground, and returned to its place; all the rest of the body immovable. Repeat with the other leg.



FIG. 3.

3.—*Circular movement of the head.*—The head is first bent forwards until the chin touches the chest; then the head is inclined in such a manner that the ear touches the shoulder; return to the position of rest in the same level. Repeat, inclining the head to the opposite side.

SERIES D.

1.—Sit up without the aid of the arms, the back straight, the head stretched out; lie down again very slowly, without bending the back.



FIG. 4.

2.—Lift the legs stretched very slowly as far as the vertical; lower them slowly.

3.—Place the right hand on the ribs as high and as far back as possible, thumb forwards; place the left forearm on the head so that the left fingers touch the right ear; bend all the body above the right hand, as far as possible to the right; take a few deep

inspirations, and return to the symmetrical position.



FIG. 5.

4.—Repeat in a reverse manner.

5.—Arms in a cross, legs and hips immovable, head straight ; bend the whole body to the left, remain during a few inspirations ; return to the position of rest.

6. Repeat in the opposite direction. (Fig. 5.)

SERIES E.—LYING ON THE STOMACH.

1.—Arms strongly stretched at the sides, raise oneself, breathe.

2.—Lift each leg stretched. Perform circular movement. The head rests on the jaw on the side of the limb lifted.



FIG. 6.

SWIMMING MOVEMENT.

3.—The palms face the ground during the whole exercise, contrary to the attitude of real swimming ; the shoulder blades are not to move on the chest ; the elbows and hands are not to touch the ground so as to avoid



FIG. 7.

passive supporting. To rest, the patient lies down completely.

SERIES F.—EXERCISES DONE IN THE UPRIGHT POSITION WITH SUPPORT.

General Instructions.—The patient either simply leans against a wall, or at first is held there by a strap round the waist until he can hold himself there without support.

1.—The first three series of movements, viz. A, B, and C, are then done in this position.

2.—Then D, 3, 4, 5, and 6. No. 5 may, however, be carried still further in this position, viz. until the left fingers touch the ground. (a) By



FIG. 8.



FIG. 9.

putting legs apart and bending left knee, or, (b) By allowing the right foot to leave the ground so that the body see-saws on the left hip joint. No. 6 may in the same way be extended.

SERIES G.—MOVEMENTS MADE WITHOUT SUPPORT.

NOTE.—All the movements which have been done against the wall should at last be performed without such help ; also



FIG. 10.

1. — *Breathing*. — Hands clasped behind the waist, inspire; hands still clasped, but arms forcibly stretched downwards, expire.

2. — *Flexion of trunk*. — Head straight, arms extended at sides of head; bend the trunk forwards from the hips, so that the fingers united by their palmar surfaces touch the ground; return to the previous attitude with the arms in the same position; the legs to remain very straight, the feet a little apart. The repetitions of the movement to be separated by circular movements of the arms.

3.—Sit down slowly upon the heels with the arms extended horizontally in front; recover to the standing position while letting the arms fall.

4.—Bend the trunk forwards, backwards, laterally, and lastly circularly, the hands resting on the hips.

5.—Separate the arms horizontally backwards as far as possible with inspiration; bring them together in front with expiration.

6.—*The Untwisting Exercise to the Left*.—Patient standing, the arms, straight and horizontal and inclined as far as possible to the right, are rapidly moved across the front of the body and as far as possible to the left, the whole spine at the same time revolving to the left; thus the hands describe about three quarters of a circle in a horizontal plane. Maintain this

position for a few moments, then allow arms to fall into, and the spine to come into, a position of rest.

7.—Reverse the exercise, *i.e.* untwist to the right.

8.—*For Poking of the Chin.*—Patient sitting. Slowly bend head forwards until chin touches chest, then rapidly bend head backwards as far as possible. Maintain the position a few seconds; return slowly to position of rest.

9.—Patient sitting, arms by side, simultaneously draws back both shoulders as far as possible, keeps them in this position while he counts four, and then allows them to return to the original position.

10.—Patient sitting, bends the body on to the thighs, then slowly rises again.

11.—Patient standing opposite a wall, at an arm's length from it, stretches out the arms horizontally in front, and applies his hands flat against the wall; without moving his feet, the patient slowly approaches his body to the wall by bending the arm on the forearm; then he slowly recovers.

NOTE.—All the preceding exercises are at first done by the patient alone. By opposing resistance to the muscular efforts, the efficacy of the various movements can be increased at will as the patient increases in strength.

12.—The patient is seated in a chair with a straight back reaching as high as the shoulders,

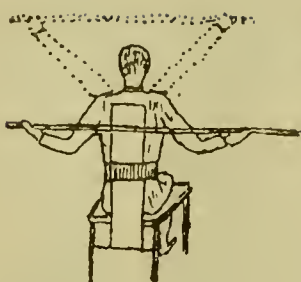


FIG. 11.

a band fixing the trunk to the back. The patient's back and shoulders should be firmly applied to the back of the chair. A rod or stick about four feet long is then grasped firmly by the hands about two inches from the ends and raised above the head, the hands still remaining two inches from the ends. The rod is next lowered behind the back of the chair as far as possible. The hands must still retain their position on the rod, but the elbows must be bent ; alternately raise and lower.

NOTE.—As the patient gets stronger the band will be unnecessary.

SERIES H.—FLAT FOOT EXERCISES.

1.—Patient standing, raises himself on his toes; remains there while counting three slowly ; then slowly return to former position.



FIG. 12.



FIG. 13.

2.—Patient standing, raises the toes, putting

his whole weight on the heels ; return to former position.

3.—Patient sitting, performs same movements, also circular movement of the foot from right to left, and *vice versa*.

4.—To walk about on the toes.

5.—Resistance may be added to 1, 2, and 3. No. 4 may be performed by carrying weights in each hand.

SERIES I.—EXERCISES OVER THE EDGE OF A TABLE.

1.—Lying down flat on the stomach on the table, the legs fixed by a strap across the ankles, the trunk going beyond the table as far as the hips. The arms stretched behind the back, bend the trunk down as far as the vertical, raise the head first, then recover slowly, stretching the arms forcibly and breathing deeply to the maximum of recovery. Repeat three times in succession ; rest, then repeat six times slowly. To rest, rise on to the knees on table. Only rise as far as the horizontal, unless otherwise directed.



FIG. 14.

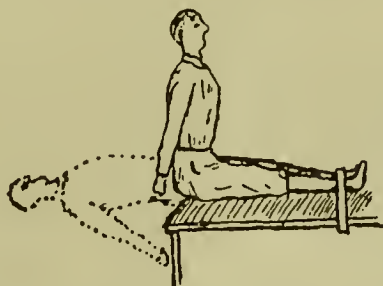


FIG. 15.

2.—Sit at the edge of a table with back at

edge, and feet retained by a strap; then head and back straight, and arms stretched behind the back, slowly lie down, breathe, return to first position.

NOTE.—Until strong enough, the patient must be supported through this exercise. The back must be kept straight, not rounded.

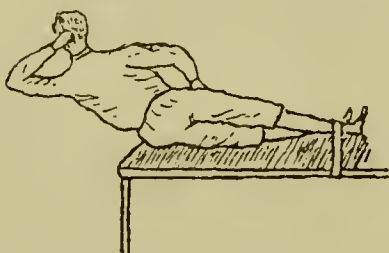


FIG. 16.

3.—Same exercise lying on the side.

(a) On the left side.
(Fig. 16.)

(b) On right side.

Part II.

EXERCISES FOR HOME OR GYMNASIUM.

SERIES J.—WITH DOWD'S MACHINE.

NOTE.—In using Dowd's machine, the patient is to commence without any other weight than that of the weight carrier. Gradually weights are added as the doctor may direct. It may, for various reasons, be found necessary to add more weights to one side than to another.

1.—*Patient facing machine.*—Patient stands facing machine. Right hand straight out in

front, grasping handle of machine, is made to describe a circle in a horizontal plane, being carried as far back as possible. Return to original position.

2.—Ditto, left hand.

3.—Same exercise, both hands together. (Fig. 17.)

4.—Right hand held vertically up, grasping handle of machine, is brought down in front, describing a semicircle in a vertical plane.

5.—Ditto, left hand.

6.—Ditto, both hands at same time.

7.—Right hand held vertically and straight up, grasping handle of machine, is brought down at the *side*, describing a semicircle in a vertical plane. Return to original position.

8.—Left hand ditto.

9.—Both hands at same time ditto.

10.—Elbows bent and at side of body, both hands grasping handles, arms to be alternately straightened and returned to original position.



FIG. 18.

M

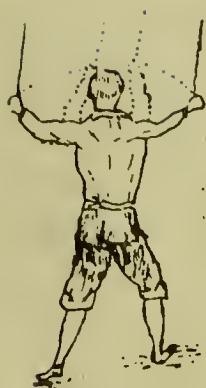


FIG. 17.

11.—Arms straight out in front, hands grasping handles, bend elbows and bring them back until they come to sides of the body; hands remain straight out. Alternately repeat and return to original position,

12.—Incline head towards machine ; grasp one handle with both hands and hold it in contact with back of the head. Bend head back as far as possible from the neck, carrying handles and hands with it. Alternately repeat and return to original position.

13.—Same exercise, but bending both back and neck as far back as possible. Return to original position.



FIG. 19.



FIG. 20.

14.—Patient erect, holding handle and hands in same position ; bend forwards, bringing head as low as possible. Return to original position.

15.—Right arm straight out from side, hand grasping handle. Hand describes a circle about a foot in diameter, its first position being the centre.

16.—Ditto, left arm.

17.—Ditto, both arms same time.

18.—The twisting exercise, Series G 6.

19.—Ditto, Series G 7.

20.—Right arm straight out in front, the hand grasping handle, is carried vertically upwards, then outwards downwards as far back as possible, and finally returned to the original position after describing a circle.

21.—Left arm ditto.

22.—Both arms together ditto.

SERIES K.—PATIENT WITH BACK TO MACHINE.

1.—Series J. Number 1 reversed.

2. " " 2 "



FIG. 21.

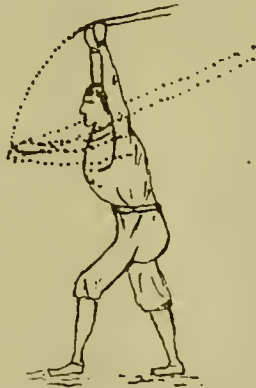


FIG. 22.

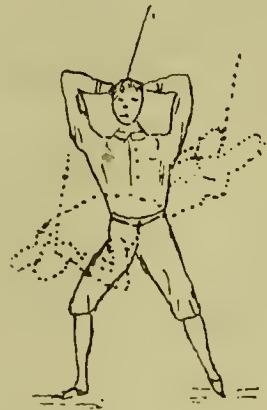


FIG. 23.

3.—Series J. Number 3 reversed.

4.	"	"	5	"
5.	"	"	5	"
6.	"	"	6	"
7.	"	"	7	"
8.	"	"	8	"
9.	"	"	9	"

10.—Series J. Number 14 reversed.

11.	„	„	15	„
12.	„	„	16	„
13.	„	„	17	„
14.	„	„	20	„
15.	„	„	21	„
16.	„	„	22	„

SERIES L.—SIDE TO MACHINE EXERCISES.

1.—Right side to machine ; arm straight out, grasping handle, carries it upwards to side of head ; returns to first position, pauses and is brought down to side ; reverse ; repeat.

2.—Left side to machine ; same exercise for left arm.

3.—Right side to machine, left forearm resting on head, left hand over right ear, grasping handle. Patient leans as far as possible towards machine, recovers and leans as far as possible away from it ; hips and legs immovable.



FIG. 24.

4.—Repeat with left side to machine, right arm over head.

5.—Repeat 3, with a circular movement instead of a to and fro.

6.—Repeat 4. With a circular movement instead of a to and fro.

SERIES M.—EXERCISES WITH A SINGLE DOWD'S MACHINE, THE ROPE PASSING UNDER A PULLEY ATTACHED TO THE FLOOR. FACE TO MACHINE.

1.—Right arm obliquely in front, holding handle. Raise to vertical by side of head without bending arm.

2.—Left arm ditto.

3.—Both hands grasping handle at same time.



FIG. 25.



FIG. 26.

4.—Right arm obliquely in front, raise fore-arm as far as possible without moving upper arm.

5.—Left arm ditto.

6.—Both together ditto.

7.—Right arm obliquely in front grasping handle, is carried backwards as far as possible, and allowed to return to original position.

8.—Left arm ditto.

9.—Both together ditto.



FIG. 27.

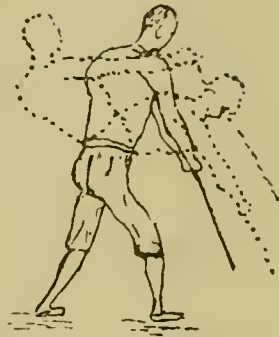


FIG. 28.

10.—Arms straight out in front, both hands grasping handle ; body bent forwards as far as possible, is raised and carried backwards as far as possible ; arms remain straight.

11.—The first two flat foot exercises are performed facing the machine, with both hands grasping handles. (Figs. 12, 13.)

SERIES N.—WITH SINGLE DOWD AS FOR SERIES M, BUT THE ROPE IS FIXED TO A STRAP, WHICH IS FASTENED TO EACH FOOT IN TURN, INSTEAD OF TO A HANDLE.

1.—For right foot. Facing machine, right hand resting on back of a chair, leg straight, is alternately carried backwards and forwards.



FIG. 29.

2.—Similar exercise with back to machine.



FIG. 30.

3.—Facing machine, right hand on back of chair ; leg is brought, from being in a line with left, as high as possible by bending the knee. Thigh remains immovable.



FIG. 31.

4.—Right side towards machine, right hand on back of chair ; the right leg is alternately held in front of left as far as possible to the left, and returned to original position.



FIG. 32.

5.—Left side towards machine, right hand on back of chair ; the right leg is carried from contact with the left as far out as possible.

6.—Right side to machine, left hand on back of chair ; right leg held obliquely outwards towards the machine, thigh immovable ; the right knee is bent until the foot touches the left leg.

7.—Patient seated right side to machine ; the left foot is alternately turned outwards and allowed to recover.



FIG. 33.



FIG. 34.



FIG. 35.

8.—Reverse exercise by turning left side to machine.

9.—Same as 1, reversed.

10.—Same as 2, reversed.

11.—Same as 3, reversed.

12.—Same as 4, reversed.

13.—Same as 5, reversed.

14.—Same as 6, reversed.

15.—Same as 7, reversed.



Part III.

GYMNASIUM EXERCISES.

NOTE.—Any of the exercises for Dowd's machine may be performed with any of the modifications of it. Thus the *High Dowd* may be used in the same way where it is required to develop especially the lower part of the chest, to help the latissimus dorsi and the lower part of the serratus magnus, trapesius, pectorals, &c., in their elevating actions on the lower ribs.

The quarter circle Dowd will be especially useful in stooping and posterior curves of the spine.

The rowing machine is a very powerful combination of all the Dowds, only to be used towards the end of a course. It exercises practically all the muscles of the body.

The roller Dowds for exercising the fingers, the wrist, and forearm muscles can be usefully employed between more powerful exercises, and the same applies to the pronation and supination machine, and to the gymnastic chair, which exercises chiefly the quadriceps extensor of the knee.

SERIES O.—WHEEL EXERCISES.

1.—Patient standing with back to wheel, arms out in a cross grasping the projecting pegs. See-saw action to and fro. Increase resistance according to patient's strength.

2.—Right side to machine, left hand on left hip, right hand grasping peg at summit of circle ; right foot forwards, spine stiff, right hand turns wheel from above downwards.

3.—Same, left foot forward.

4.—Same as 2, reversed.

5.—Same as 3, reversed.

6.—Right side to machine, feet together, right hand grasping lowest peg, left hand passing over head grasps highest peg, right hand to move forwards, left backwards.

7.—Same reversed.

SERIES P.—EXTENSION EXERCISES FOR ACTING
CHIEFLY ON THE SPINAL LIGAMENTS.

1.—*Oblique ladder*.—Patient on back, feet on lowest two rungs, hands on highest rungs he

can reach. Raise feet to the rungs of next level, the hands bearing the weight meanwhile ; raise hands to rungs of next level above them, feet bearing the weight meanwhile ; remove feet from rungs for a few seconds so that hands bear all weight. Raise feet to next level, and so on until the top is reached. Come down in reverse order.

2.—Ditto, with right arm always one rung above the other.

3.—Ditto, with left arm always one rung above right.

SERIES Q.—EXERCISES WITH PARALLEL RINGS.

1.—Patient stands between rings which are suspended about a foot above his head. Then grasping the rings and keeping feet fixed as a pivot, he performs a circular movement of the whole body from right forwards to left ; from left backwards to right.

2.—The rings may be gradually lowered.

3.—Right ring may be a few inches higher than left.

4.—Left ring may be a few inches higher than right.

SERIES R.—VERTICAL POLE OR ROPE.

NOTE.—This exercise is best performed with the pole or rope rigid or suspended against a wall.

1.—Patient stands with his back to pole, the

hands above head, grasps the pole as high as possible ; then raising the heels from the ground, the patient endeavours, with one hand at a time, to grasp the pole above the other hand. The patient then allows the hands to bear the weight in endeavouring to get the heels again on to the ground.

- 2.—Same exercise, right hand always higher.
- 3.—Same exercise, left hand always higher.

SERIES S.—TRAPEZE OR PARALLEL RINGS.

Patient standing on a stool, trapeze at such a height that the patient can just reach it with hands above head. Patient grasps trapeze, stool is removed, and patient swings backwards and forwards by alternately flexing and extending his legs.

SERIES T.—VERTICAL LADDER OR GRIDIRON.

- 1.—Same as Series P, 1.
- 2.—Same as Series P, 2.
- 3.—Same as Series P, 3.
- 4.—Right foot on one of the lower rungs, right hand on one of the upper, so that right side of body forms a concavity towards ladder. Alternately stretch left arm and left leg as far to the left as possible, and allow them to return to the hanging position.
- 5.—Ditto reversed.

6.—Climb with back to ladder, using only left hand, right hand carrying a weight.

7.—Same with face to ladder.

8.—Same as 6, left hand carrying a weight.

9.—Same as 7, left hand carrying a weight.

SERIES V.—DUMB-BELLS.

NOTE.—The efficacy of most of the exercises from A to F can be increased by the use of dumb-bells from half a pound to five pounds in weight.

1.—Holding dumb-bell of five pounds or more at level of shoulder in right hand. . Alternately raise and lower.

2.—Ditto with left hand.

SERIES W.

Alternately raise and lower above head a heavy steel bar, using both hands. The patient should fix his eyes on the centre of the bar.

SERIES X.—FOR BOW LEGS.

1.—Patient, standing with legs a few inches apart, endeavours firmly to *internal* rotate the knees, holds them in this position a few seconds and then relaxes his muscles. He must not move his feet from the ground, or bend his knees in this exercise.

SERIES Y.—FOR KNOCK-KNEE.

1.—Same as above except that the movement is one of *external* rotation, with slight bending of the knee. Young children may be taught this movement lying down, at first simply rotating the whole leg and foot out. When they have learnt this, the foot can be fixed by an assistant, and the same movement attempted.

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